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Health and Safety Plan for Construction of the Staging, Storage, Sizing, and Treatment Facility

March 2002

Idaho National Engineering and Environmental Laboratory
Bechtel BWXT Idaho, LLC

INEEL/EXT-01-00271

Health and Safety Plan for Construction of the Staging, Storage, Sizing, and Treatment Facility

March 2002

Idaho National Engineering and Environmental Laboratory
Environmental Restoration Department
Idaho Falls, Idaho 83415

Prepared for the
U.S. Department of Energy
Assistant Secretary for Environmental Management
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ABSTRACT

This health and safety plan establishes the procedures and requirements used to eliminate or minimize health and safety risks to persons performing work tasks for construction of the Staging, Storage, Sizing, and Treatment Facility as part of the INEEL CERCLA Disposal Facility Complex at the Idaho Nuclear Technology and Engineering Center located at the Idaho National Engineering and Environmental Laboratory, as required by the Occupational Safety and Health Administration standard, 29 Code of Federal Regulations 1926.65, "Hazardous Waste Operations and Emergency Response." It contains information about the hazards related to construction tasks, as well as the specific actions and controls that will be used to protect persons while working at the task site.

This health and safety plan contains the safety, health, radiological hazards assessment, and procedures for safely executing all Staging, Storage, Sizing, and Treatment Facility construction tasks. The intent of this document is to identify known hazards and serve as a plan for mitigating them. Safety and health professionals supporting these field activities must determine the most appropriate hazard control and mitigation measures based on site-specific conditions and shall make changes to this health and safety plan and associated work control documents, as appropriate.

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ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ALARA	as low as reasonably achievable
ANSI	American National Standards Institute
Anti-C	anticontamination
APF	assigned protection factor
APR	air-purifying respirator
ARDC	Administrative Record and Document Control
BBWI	Bechtel BWXT Idaho, LLC
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
CM	construction manager
CPP	(Idaho) Chemical Processing Plant (now the INTEC)
CRC	contamination reduction corridor
CRZ	contamination reduction zone
DAC	derived air concentration
DAR	document action request
dBA	decibel A-weighted
DOE	Department of Energy
DOE-ID	Department of Energy Idaho Operations Office
DOT	Department of Transportation
EAM	emergency action manager
ECA	environmentally controlled area
ECC	emergency control center
EDF	engineering design file

EPA	Environmental Protection Agency
ER	environmental restoration
ERIS	Environmental Restoration Information System
ERO	Emergency Response Organization
ES&H	environment, safety, and health
ESH&QA	environment, safety, and health and quality assurance
EZ	exclusion zone
FCC	field construction coordinator
FFA/CO	Federal Facility Agreement and Consent Order
FR	Federal Register
FSP	field sampling plan
GM	Geiger-Mueller
HASP	health and safety plan
HASS	Hazards Assessment and Sampling System
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEPA	high-efficiency particulate air
HPSC	hazard profile screening checklist
HSO	health and safety officer
HWMA	(Idaho) Hazardous Waste Management Act
ICDF	INEEL CERCLA Disposal Facility
ICS	Incident Command System
IDLH	immediately dangerous to life or health
IDW	investigation-derived waste
IH	industrial hygiene, industrial hygienist
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center

IRT	incident response team
ISMS	Integrated Safety Management System
JSA	job safety analysis
LDR	land disposal restrictions
MCP	management control procedure
MSDS	material safety data sheet
NEPA	National Environmental Policy Act
NIOSH	National Institute of Occupational Safety and Health
OMP	Occupational Medical Program
OSC	on-scene commander
OSHA	Occupational Safety and Health Administration
OU	operable unit
PCB	polychlorinated biphenyl
PCM	personal contamination monitor
PEL	permissible exposure limit
PLN	plan
PM	project manager
POD	plan-of-the-day
PPE	personal protective equipment
PRD	program requirements document
QA	quality assurance
QAPjP	Quality Assurance Project Plan
QE	quality engineer
RadCon	radiological control
RBA	radiological buffer area
RCIMS	Radiological Control and Information Management System

RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RD/RA	remedial design/remedial action
RE	radiological engineer
RI/BRA	remedial investigation/baseline risk assessment
ROD	Record of Decision
RWP	radiological work permit
SAD	site area director
SCBA	self-contained breathing apparatus
SE	safety engineer
SH&QA	safety, health, and quality assurance
SRPA	Snake River Plain Aquifer
SSA	Staging and Storage Annex
SS	shift supervisor
SSSTF	Staging, Storage, Sizing, and Treatment Facility
STR	subcontract technical representative
SWP	safe work permit
SZ	support zone
TLV	threshold-limit value
TPR	technical procedure
TRAIN	Training Records and Information System
TSCA	Toxic Substances Control Act
TWA	time-weighted average
USCG	United States Coast Guard
USQ	unresolved safety question
VPP	Voluntary Protection Program

WAC	Waste Acceptance Criteria
WAG	waste area group
WCC	Warning Communications Center

Health and Safety Plan for Construction of the Staging, Storage, Sizing, and Treatment Facility

1. INTRODUCTION

This health and safety plan (HASP) establishes the procedures and requirements used to eliminate and/or minimize health and safety risks to persons during the construction of the Staging, Storage, Stabilization, and Treatment Facility (SSSTF) as part of the INEEL CERCLA Disposal Facility (ICDF) Complex.

This HASP meets the requirements of the Occupational Safety and Health Administration (OSHA) standard, 29 Code of Federal Regulations (CFR) 1926.65, "Hazardous Waste Operations and Emergency Response (HAZWOPER)." Its preparation is consistent with information and guidance found in the National Institute of Occupational Safety and Health (NIOSH)/OSHA/United States Coast Guard (USCG)/U.S. Environmental Protection Agency (EPA) *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (NIOSH 1985); Idaho National Engineering and Environmental Laboratory (INEEL) safety and health manuals (Safety and Health Department 2002a,b); and *Manual 15A - Radiation Protection - INEEL Radiological Control Manual,* (Radiological Control Department 2000); and U.S. Department of Energy Guide DOE G 440.1-2, "Construction Safety Management Guide."

This HASP was prepared in accordance with Bechtel BWXT Idaho, LLC (BBWI) management control procedure (MCP) -255, "Hazardous Waste Operations and Emergency Response Activity Health and Safety Plans," and reviewed according to BBWI MCP, "Internal/Independent Review of Documents" (MCP-240). It will be reviewed and revised as appropriate by the health and safety officer (HSO), in conjunction with the field construction coordinator (FCC) and the Idaho Nuclear Technology and Engineering Center (INTEC) site area director (SAD) or designee including the environmental, safety, health, and quality assurance (ESH&QA) manager or designee, to ensure its effectiveness and suitability throughout construction. The environmental restoration (ER) Waste Area Group (WAG) 3 Safety, Health, and Quality (SH&QA) point of contact will review all document action requests (DARs) to revise this HASP.

The SSSTF construction tasks will be conducted at locations within the INTEC SAD's jurisdiction. All tasks will be performed by employees of BBWI or BBWI subcontractors.

1.1 INEEL Site Description

The INEEL is a U.S. government-owned test site, managed by the DOE, that is located in southeastern Idaho, 51.5 km (32 mi) west of Idaho Falls (see Figure 1-1). The INEEL encompasses approximately 2,305 km^2 (890 mi^2) of the northeastern portion of the Eastern Snake River Plain. The Eastern Snake River Plain is a relatively flat, semiarid, sagebrush desert, with predominant relief being manifested either as volcanic buttes jutting up from the desert floor or as unevenly surfaced basalt flows or flow vents and fissures. Elevations on the INEEL range from 2,003 m (6,572 ft) in the southeast to 1,448 m (4,750 ft) in the central lowlands, with an average elevation of 1,516 m (4,975 ft). Drainage within and around the plain recharges the Snake River Plain Aquifer (SRPA), a sole source aquifer that flows beneath the INEEL and surrounding area. The aquifer is approximately 137 m (450 ft) below ground surface within the site boundaries.

Regional groundwater flow is southwest at average estimated velocities of 1.5 m/day (5 ft/day).

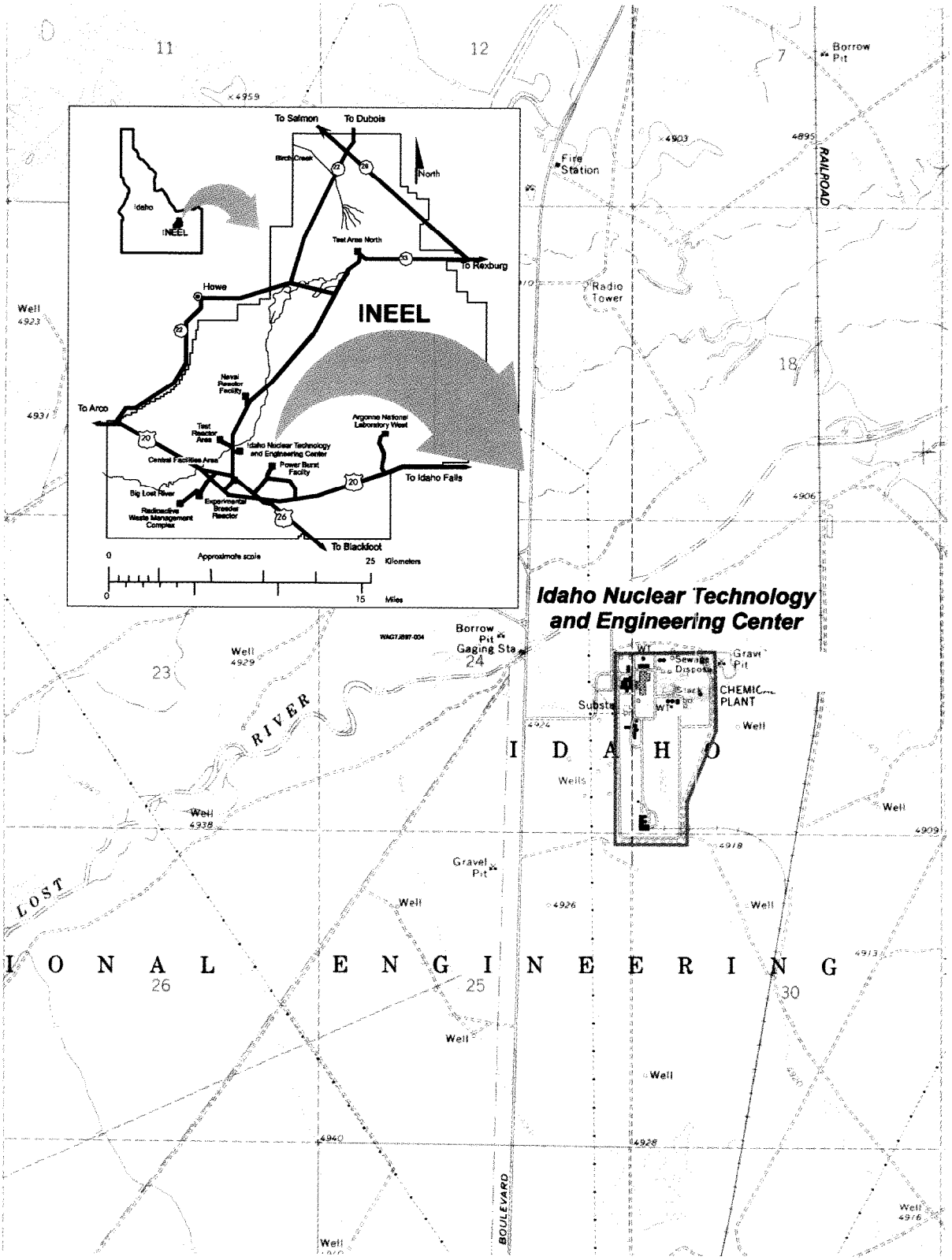

Figure 1-1. Map of the INTEC at the INEEL (topography adapted from U.S. Geological Survey Circular Butte 3SW, contour interval 10 ft, scale 1:24000).

The U.S. Atomic Energy Commission initially established the Site in 1949 as the National Reactor Testing Station for nuclear energy research and related activities. In 1952, the Site expanded its function and began accepting shipments of transuranic radionuclides and radioactive low-level waste. In 1974, it was re-designated the Idaho National Engineering Laboratory, and then, in 1997, in order to reflect the expansion of its mission to include a broader range of engineering and environmental management activities, the name was changed to INEEL. Currently, the INEEL is used to support the engineering efforts and operations of the DOE and other federal agencies in areas of nuclear safety research, reactor development, reactor operations and training, nuclear defense materials production, waste management technology development, and energy technology and conservation programs. The DOE Idaho Operations Office (DOE-ID) has responsibility for the INEEL and delegates authority to operate the INEEL to government contractors. BBWI provides management and operating services to the majority of INEEL facilities for DOE-ID.

In November 1989, because of confirmed contaminant releases to the environment, the EPA placed the INEEL on the National Priorities List of the National Oil and Hazardous Substances Pollution Contingency Plan (54 FR 48184). In response to this listing, the DOE, the EPA, and the State of Idaho negotiated a Federal Facility Agreement and Consent Order (FFA/CO) and Action Plan. The FFA/CO and Action Plan, which was signed in 1991, established the procedural framework and schedule for developing, prioritizing, implementing, and monitoring response actions at the INEEL in accordance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Resource Conservation Recovery Act (RCRA), and the Idaho Hazardous Waste Management Act (HWMA) (DOE-ID 1991).

To better manage cleanup activities, the INEEL was divided into 10 WAGs; INTEC is designated as WAG 3. Each WAG contains a number of contaminant release sites grouped into operable units (OUs) based on similarity of waste streams and projected remedial actions.

1.2 INTEC Site Description

The INTEC, located in the south-central portion of the INEEL, commenced operations in 1952. Historically, the INTEC has been a uranium reprocessing facility for both defense projects and research, while also acting as a storage facility for spent nuclear fuel. Irradiated defense nuclear fuels were reprocessed to recover unused uranium. Liquid waste generated from these activities was either stored at the INTEC tank farm for treatment at the calcining facility or if of low enough concentrations historically disposed of in the INTEC Injection Well (Chemical Processing Plant [CPP-23]). After fuel dissolution and extraction, the liquid waste was calcined, and the resultant granular solids were subsequently stored in stainless steel bins. Depending on the type of fuel reprocessing used, several types of high-level radioactive liquid waste have been produced at the INTEC. A phaseout of the INTEC's reprocessing activities began in 1992, including fuel dissolution, solvent extraction, product denitration, and other processes.

The geology at INTEC consists of a layered sequence of fractured basalt flows with intercalated sediments, commonly referred to as sedimentary interbeds. The depth to the SRPA is approximately 138 m (455 ft). Several sedimentary interbeds are present in the basalt above the water table. Two major perched water zones are associated with interbeds at depths of approximately 115 m (380 ft) (deep perched water) and between 33 to 42 m (110 to 140 ft) (shallow perched water). The shallow perched zone (33 to 42 m [110 to 140 ft]) actually consists of two separate perched zones in the vicinity of the tank farm, which lie on the CD interbed and the DE 1-2 interbed, respectively. These are referred to as the upper shallow and lower shallow perched water zones. Perched water at a depth of approximately 115 m (380 ft) is referred to as the deep perched water. Below the water table is the HI interbed, present at a depth of approximately 158 to 164 m (520 to 575 ft).

1.3 SSSTF Complex Description

A comprehensive study, or remedial investigation/baseline risk assessment (RI/BRA) (DOE-ID 1997), was conducted to evaluate the nature and extent of soil and groundwater contamination at the INTEC. The results of the RI/BRA activities indicate that soil at certain release sites and groundwater contamination pose a potential risk above acceptable levels to human health and the environment. Therefore, DOE-ID authorized a remedial design/remedial action (RD/RA) for the INTEC, resulting in the WAG 3, OU 3-13 Record of Decision (ROD) (DOE-ID 1999).

The ROD states that CERCLA-generated wastes from within the INEEL boundaries will be removed and disposed of in the ICDF. The ICDF Complex will be an on-Site facility for treatment and disposal of low-level, hazardous, mixed, and some Toxic Substances Control Act (TSCA) wastes. The ICDF Complex includes necessary subsystems and support facilities to provide a complete waste disposal system. The major components of the ICDF Complex are the disposal cells (referred to as ICDF and includes the evaporation pond and leachate collection system) and the SSSTF.

The ICDF is a low-level, hazardous, TSCA, and mixed waste disposal facility (landfill cell[s] and evaporation pond) with an authorized capacity of approximately 390,000 m^3 (510,000 yd^3). The ROD states that CERCLA-generated wastes within the INEEL facility will be removed and disposed in the ICDF. The evaporation pond will provide treatment/disposal capability for CERCLA-generated aqueous wastes. The ICDF landfill can have multiple cells and will be closed with a DOE 435.1/RCRA-compliant cover. Each disposal cell will be engineered to meet DOE Order 435.1, RCRA Subtitle C, HWMA, and TSCA polychlorinated biphenyl (PCB) landfill design and construction requirements. The landfill complex will be located southwest of the INTEC and adjacent to the existing percolation ponds.

The SSSTF will be the center for all waste handling and processing for the ICDF Complex (DOE-ID 2000a). The facility will provide centralized receiving, inspection, and treatment necessary to stage, store, size, and treat incoming waste from various INEEL CERCLA remediation sites prior to final disposition. Wastes meeting the ICDF Waste Acceptance Criteria (WAC) will be transported directly to the ICDF. Wastes that do not meet the ICDF WAC will be treated at the SSSTF to meet the ICDF WAC, packaged for shipment off-Site, or transported to appropriate on-Site disposal.

All SSSTF activities shall take place within the WAG 3 area of contamination (AOC) to allow flexibility in managing the consolidation and remediation of wastes without triggering land disposal restrictions (LDRs) and other RCRA requirements, in accordance with the OU 3-13 ROD. Only low-level, mixed low-level, hazardous, and limited quantities of TSCA wastes will be treated and/or disposed of at the ICDF. Most of the waste will be contaminated soil, but debris and investigation-derived waste (IDW) will also be included in the waste inventory. This will include the staging and storage of CERCLA soils, debris, aqueous waste, and containerized wastes from all WAGs as directed by DOE. Characterization, transportation, and treatability study confirmation (nonroutine) activities are the responsibility of the individual WAG waste generating sites to meet SSSTF and ICDF WACs.

Note: Construction of the ICDF is not addressed in this HASP.

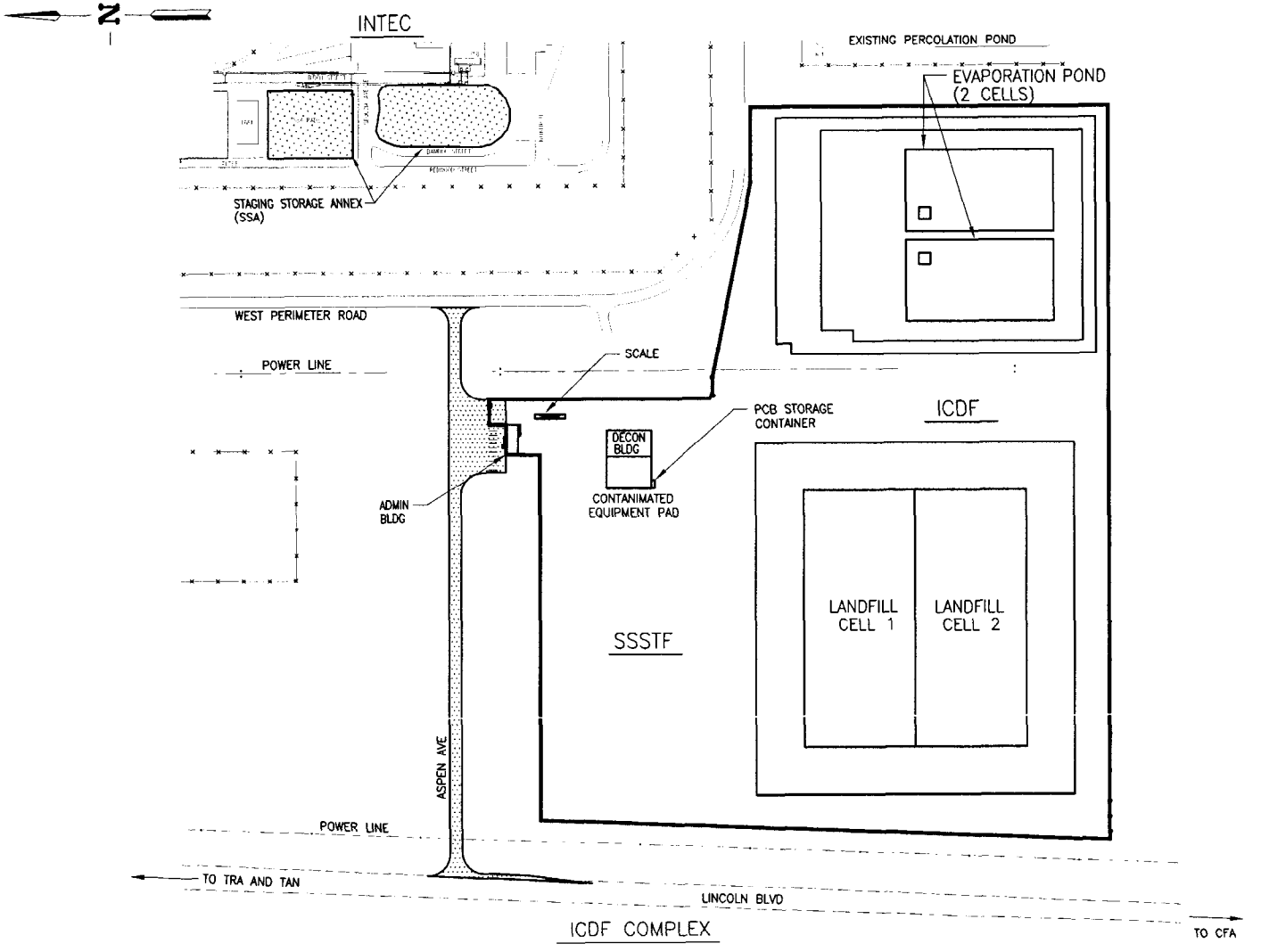

Figure 1-2. SSSTF area in the ICDF Complex (based on conceptual design) at the INTEC.

1.4 SSSTF Construction Scope of Work

SSSTF construction activities will take place within the WAG 3 AOC which will require the area to be delineated as a CERCLA area until the area is found to be contamination-free during excavation or other soil disturbance activities. The SSSTF is within CPP-95 which is from the windblown plume consisting of areas outside the current INTEC perimeter fence that are potentially contaminated as a result of wind dispersion of radionuclides from facility operations. The SSSTF utilities tie-in is part of the *SSSTF Remedial Design/Construction Work Plan (RD/CWP)* (DOE-ID 2002) activities and includes working inside site ECA CPP-88 at INTEC where radiological contamination is anticipated.

The scope of work for construction of the SSSTF consists of all tasks and related activities necessary to construct the following:

- Administration building
- Truck weigh scales
- Decontamination (decon) building
  - Minimum treatment system/stabilization
  - Debris treatment
- Roads and grounds
- SSSTF/ICDF utilities.

The administration building will be utilized for operations management and support staff as the waste mangement data collection functions. It will include a system indicator panel that identifies water levels and key equipment operational status, but does not include controls for remote operations. A key function will include the truck weigh scales to weigh incoming wastes and outgoing tare weights.

The decon facility will contain crew change rooms, bathrooms, a treatment area, a drive-through area for the wash-down of contaminated waste hauling equipment, a PCM, CAM(s), and miscellaneous RadCon equipment. This facility will also provide limited capabilities for minimal waste treatment to include a mini-cement/batch plant for stabilizing soil prior to ICDF disposal. Capabilities will allow boxed wastes from CPP-92, -98, and -99 and CFA-04 to be processed to meet the ICDF WAC. The process will require the mixing of cement with soils and water and must have dust suppression capabilities.

The facility will be constructed with a secondary containment system for the building floor slabs and related water collection and distribution to the ICDF evaporation pond. HEPA systems will be utilized for the control of chemical and radiological contaminants in the equipment decon area and the minimal treatment area used primarily for the stabilization of soil.

The SSSTF will be completely fenced with the main access controlled by a gate adjacent to the administration building. Additional features to be constructed include asphalt paving, drainage ditches, and a contaminated equipment storage pad (paved) adjacent to the decon building. The entire SSSTF will be located on 1–2 ft of clean fill above existing ground level. Utilities include electrical power, fire water, raw water, potable water, sanitary sewer, communications, operational status signals, and others necessary for the facility operation.

1.5 Additional Activities

Ancillary activities that will be performed prior to the start of this project include the following:

- Prepare National Environmental Policy Act (NEPA) documentation, including an environmental checklist
- Prepare work control documentation/integrated planning sheets
- Complete a hazards profile screening checklist and job walk-down in accordance with appropriate work control procedures (STD-101)
- Prepare a job safety analysis (JSA)
- Prepare USQ(s) for construction of the SSSTF against the INTEC Safety Analysis Report (as required) (Johnson and Cole 2000)
- Prepare a waste characterization report and Form L-0435 for waste disposal (as required).

2. KEY SITE PERSONNEL RESPONSIBILITIES

The organizational structure for this project reflects the resources and expertise required to perform the work, while minimizing risks to worker health and safety, the environment, and the general public. Job titles of the individuals in key roles at the work site and lines of responsibility and communication are shown on the organizational chart for the site (Figure 2-1). The following sections outline the responsibilities of key project personnel and ER management.

2.1 Project Field Personnel

2.1.1 Environmental Restoration Field Project Personnel

All field team members, including BBWI and subcontract personnel, shall understand and comply with the requirements of this HASP. The STR and HSO will jointly conduct the plan of the day (POD) briefing at the start of each shift. All tasks to be conducted, associated hazards, hazard mitigation, emergency conditions, and emergency actions will be discussed. Input will be provided by the project HSO, industrial hygienist (IH), safety engineer, and radiological control technician (RCT) personnel to clarify task health and safety requirements. All personnel are encouraged to provide input and ask questions for clarification of tasks and hazard mitigation methods based on previous lessons learned. Documentation of the POD will be recorded daily in the environmental restoration field construction coordinator (FCC) or STR logbook.

2.1.2 ER Field Construction Coordinator

The ER FCC is the individual in the field with the responsibility for the safe and successful completion of assigned project tasks. The ER FCC manages field operations, executes the work plan, enforces site control, and is responsible to ensuring pre-job briefings are conducted in accordance with MCP-3003, "Pre-job and Post-Job Briefings," and may conduct the POD briefings at the start of the shift. Additionally, the FCC may serve as the STR in the field.

The nature of the SSSTF construction project will require extensive subcontractor interface. The FCC will serve as the primary interface with subcontractor personnel at the project site. All health and safety issues must be brought to the attention of the FCC. The FCC may also serve in a technical support capacity at the INTEC command post during an emergency event. The FCC reports to the WAG 3 manager. Additional responsibilities include, but are not limited to

- Performing technical and operational evaluations of the construction activities
- Ensuring all personnel are trained to required work control and field safety documentation
- Ensuring compliance with field documentation, construction specification, and special conditions.

If the FCC leaves the site, an alternate will be appointed to act as the FCC or a means of contact with the FCC (e.g., radio, cell phone) will be communicated to the construction superintendent and other key construction project personnel. Persons acting as the FCC on the site must meet all FCC training requirements outlined in Section 4 of this HASP. The identity of the acting FCC shall be communicated to site personnel.

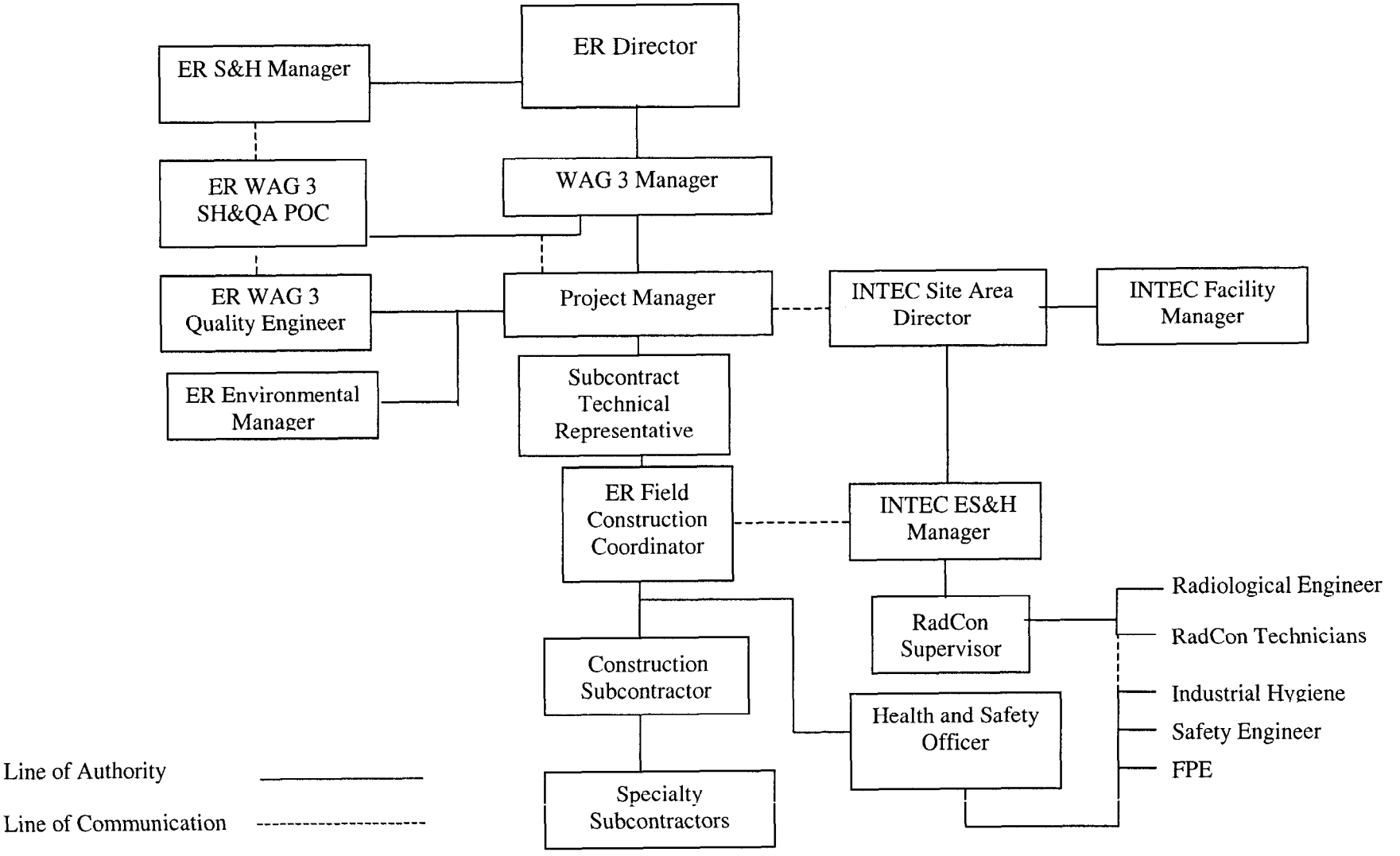

Figure 2-1. Organizational chart for the SSSTF construction.

2.1.3 Subcontractor Technical Representative

The STR is responsible for field implementation of the project. This responsibility involves ensuring that all tasks receive appropriate health and safety review before commencement and that the necessary equipment and facilities are made available to implement the provisions of this plan. Additionally, the STR or FCC will serve as the primary interface with subcontractor personnel at the project.

The STR is the individual with ultimate responsibility for the safe and successful completion of assigned project tasks. The STR enforces project control, documents project activities, and may conduct the daily pre-job safety briefings at the start of the shift. Health and safety issues at the project must be brought to the HSO's attention.

If the STR leaves the project, an alternate individual will be appointed to act as the STR. People acting as STR on the project must meet all training requirements outlined in Section 4 of this HASP. The identity of the acting STR shall be conveyed to project personnel, recorded in the daily force report, and communicated to the facility representative when appropriate.

If the nature of the field work requires involvement or field team staffing by equipment operators, laborers, or other crafts, a representative from the organization supplying these additional resources will interface with the STR to provide work supervision. This person may be designated the job site supervisor (JSS). Additionally, the STR will serve as the primary interface with subcontractor personnel at the project.

2.1.4 Health and Safety Officer

The HSO is the person assigned to the task site who serves as the primary contact for all health and safety issues. The HSO advises the FCC and STR on all aspects of health and safety and is authorized to stop work at the task site if any operation threatens worker or public health and/or safety. In addition, the HSO is authorized to verify compliance with the HASP, to conduct conformance inspections and self-assessments, to require and monitor corrective actions, and to monitor decontamination procedures, as appropriate.

Other ES&H professionals at the task site (including the safety engineer [SE], IH, RadCon, RE, environmental representative, and facility representative) may support the HSO, as necessary. Personnel assigned as the HSO, or alternate HSO, must be qualified (pursuant to the OSHA definition) to recognize and evaluate hazards and will be given the authority to take or direct actions to ensure that workers are protected. While the HSO may also be the IH, SE, or in some cases the FCC (depending on the hazards, complexity, and size of the activity involved), other task-site responsibilities of the HSO must not conflict with the role of the HSO at the task site.

If it is necessary for the HSO to leave the site, an alternate individual must be appointed by the HSO to fulfill this role, and the identity of the acting HSO will be communicated to task-site personnel and documented by the STR or FCC. Due to the complexity and size of this project, full-time HSO support is warranted.

2.1.5 Subcontract Personnel

All subcontract personnel, including all lower-tier subcontractor personnel, shall understand and comply with the requirements of this HASP. The FCC, HSO, or subcontractor representative will conduct the POD briefing at the start of each shift. During the POD briefing, all daily tasks, associated hazards,

hazard mitigation (e.g., engineering and administrative controls, required PPE, work control documents), and emergency conditions and actions will be discussed. Input will be provided, as deemed appropriate, by the project HSO and IH and by RadCon personnel to clarify task health and safety requirements. All personnel are encouraged to ask questions regarding site tasks and provide suggestions on ways to perform required tasks in a more safe and effective manner based on the lessons learned from previous days' activities. Documentation of the POD will be recorded by the FCC.

Once at the site, personnel are responsible for identifying any potentially unsafe situations or conditions to the FCC, HSO, or subcontractor superintendent for corrective action. **If it is perceived that an unsafe condition poses an imminent danger, site personnel are authorized to stop work immediately (take action necessary to protect the worker, the public, the environment, and the facility), then notify the FCC or HSO of the unsafe condition.**

2.1.6 Lower-Tier Specialty Subcontractors/Occasional Site Workers

All lower-tier construction personnel who may be on the site for short periods (e.g., specialty subcontractors who are onsite only occasionally for a specific task) are considered occasional site workers for the purposes of this project. A person shall be considered "onsite" when they are present in or beyond the designated construction area fence/rope. Occasional site workers must receive site-specific HASP training prior to entering beyond the posted construction area fence/rope. They must also meet all required training for the area of the site they have a need to access, based on the tasks taking place, as identified in Section 4. In addition, a construction subcontractor supervisor (or representative meeting the HAZWOPER supervisor training requirements) shall supervise occasional site workers who have not completed their 1 or 3 days of supervised field experience in accordance with the HAZWOPER standard (29 CFR 1926.65(e)).

Note: The determination as to whether an occasional site worker requires 24-hr or 40-hr HAZWOPER training and corresponding 1 or 3 days of supervised field experience will be made by the HSO based on the following factors:

- Potential for exposure to safety and health hazards on the construction site
- Duration of task/activity to be conducted
- Co-located activities that may present additional safety of health hazards
- Ability to monitor or recognize changing conditions (increased safety and health hazards).

2.1.7 Occasional Workers

All persons who may be on the site, but are not part of the field team, are considered occasional workers for the purposes of this project (e.g., surveyor, equipment operator, or other crafts personnel not assigned to the project). A person will be considered "onsite" when they are present in or beyond the designated support zone (SZ). Occasional workers per 29 CFR 1910.120/1926.65 shall meet minimum training requirements and any additional site-specific training that is identified in Section 4. If the nature of an occasional worker's tasks requires entry into the exclusion zone (EZ) or radiologically controlled areas, then they must meet all the same training requirements as other field team members. In addition, a site representative must accompany all occasional workers until they have completed 3 days of supervised field experience.

2.1.8 Visitors

All visitors with official business at the construction site (including BBWI personnel, representatives of DOE, and/or state or federal regulatory agencies) may not proceed beyond the construction area boundary without receiving a site-specific briefing, meeting PPE requirements, and providing proof of training. Additional requirements include

- Receiving site-specific HASP training (or hazard briefing based on specific tasks). The site-specific HASP training includes an overview of the entire document discussing the following at a minimum:
  - Scope of work
  - Organization structure
  - Recordkeeping requirements
  - Personnel training requirements and verification
  - Accident prevention
  - Worksite control and security
  - Hazard identification, mitigation, and PPE requirements
  - Decontamination procedures
  - Emergency response plan.

A plan of the day (POD) briefing will be held to discuss prior activities and safety-related issues. The activities to be conducted that day will also be discussed, including potential and existing hazards, mitigation strategies, and needed support to accomplish activities safely.

Note: Access to other controlled areas during downtime or low-hazard tasks (no potential for exposure above action limits or significant safety hazards) may only require a hazard briefing.

- Signing a HASP training form and providing proof of meeting all training requirements specified in Section 4 of this HASP (or required training for the area to be accessed during downtime or low-hazard activities)
- Signing applicable work control documents (e.g., radiological work permits [RWP], a SWP, and a JSA for the area to be accessed)
- Wearing the appropriate PPE.

A fully trained task-site representative (such as the FCC, HSO, or subcontractor representative) will escort visitors entering the project site beyond the construction area boundary if the visitors do not have objective evidence of meeting the 24-hr supervised field experience requirement (29 CFR 1926.65(e)), as site conditions warrant, and as deemed appropriate by the FCC.

Note: Visitors may not be allowed into the construction area during certain high-hazard project site tasks (heavy equipment operation, excavation, or equipment movement) to minimize safety and health hazards. The determination as to any visitor's demonstrated "need" for access into the construction area will be made by the FCC and HSO in consultation with INTEC RadCon personnel (as applicable).

Visitors with no official business at the construction site will not be permitted onsite.

2.2 INTEC Personnel

2.2.1 INTEC Site Area Director

The INTEC SAD reports to the director of site operations and interfaces with the INTEC facility manager. The INTEC site area director is responsible for several functions and processes in the INTEC area that include

- Approving all work packages/control documents to be performed in the INTEC area
- Establishing and executing a monthly, weekly, and daily operating plan for the INTEC area
- Executing the ESH&QA program for the INTEC area
- Executing the Integrated Safety Management System (ISMS) for the INTEC area
- Executing enhanced work planning for the INTEC area
- Executing the Voluntary Protection Program (VPP) in the INTEC area
- Ensuring environmental compliance within the INTEC area
- Executing that portion of the voluntary compliance order that pertains to the INTEC area
- Correcting the root cause functions of the accident investigation in the INTEC area
- Performing all reporting actions (e.g., to DOE-ID) following an accident or spill.

2.2.2 INTEC Facility Manager

The INTEC facility manager is responsible for maintaining the assigned facility and must be cognizant of work being conducted in the facility. The INTEC facility manager is responsible for the safety of personnel and the safe completion of all project activities conducted within the area in accordance with the SAD concept.

The facility manager and INTEC shift supervisor (SS) will be kept informed of all SSSTF construction project tasks performed. The INTEC SS and FCC shall agree on a schedule for reporting work progress and plans for work. The INTEC SS will serve as a contact to task-site personnel with regard to construction activities that may impact INTEC operations.

2.2.3 INTEC ES&H Manager

The INTEC ES&H manager, or designee, is responsible for managing INTEC ES&H resources assigned to the construction project. The INTEC ES&H manager directs the INTEC resources and reviews or assigns ES&H personnel to review STD-101 work packages and other construction health and safety documentation to ensure compliance with INTEC requirements and safety basis.

2.2.4 ER WAG 3 Radiological Engineer

The radiological engineer (RE) is the primary source for information and guidance relative to the evaluation and control of radioactive hazards that may be encountered in the environmentally controlled area (ECA) affected by excavation tasks. The RE will provide engineering design criteria and review of contamination controls and makes recommendations to minimize health and safety risks to site personnel as required and as deemed appropriate by the INTEC RadCon organization.

2.2.5 Radiological Control Technician

The assigned radiological control technician (RCT) is the primary source for information and guidance on radiological hazards that may be encountered during construction and sampling tasks. Responsibilities of the RCT include (1) radiological surveying of the site, equipment, and samples (if collected); (2) providing guidance for radioactive decontamination of equipment and personnel (as required); and (3) accompanying the affected personnel to the nearest INEEL medical facility for evaluation if significant radionuclide contamination occurs.

The RCT must notify the HSO and FCC of any radiological occurrence that must be reported as directed by the *INEEL Radiological Control Manual* (Radiological Control Department 2000). The RCT may have other duties at the site as specified in other sections of this HASP, or in BBWI program requirements documents (PRDs) and/or MCPs. It is anticipated that initial excavation tasks at the SSSTF will require full-time coverage by an RCT with intermittent coverage thereafter. However, the final determination of RadCon coverage will be specified by the INTEC RadCon supervisor based upon potential and existing conditions.

2.3 ER Program and Project Management

2.3.1 Environmental Restoration Director

The ER director has the ultimate responsibility for the technical quality of all projects, maintaining a safe environment, and the safety and health of all personnel during field activities performed by or for the INEEL ER program. The ER director provides technical coordination and interfaces with the DOE-ID Environmental Support Office. The ER director ensures the following:

- Project/program activities are conducted according to all applicable federal, state, local, and company requirements and agreements.
- Program budgets and schedules are approved and monitored to be within budgetary guidelines.
- Personnel, equipment, subcontractors, and services are available and provided.

- Direction is provided for task development, findings evaluation, conclusions and recommendations development, and reports production.

- Review of the activities is performed in accordance with PRD-25 (as applicable) prior to commencing work activities.

2.3.2 Environmental Restoration Project Manager

The ER project manager (PM) shall ensure that all activities conducted during the project comply with (1) BBWI MCPs and PRDs; (2) all applicable OSHA, EPA, DOE, U.S. Department of Transportation (DOT), and State of Idaho requirements; and (3) the *Implementation Project Management Plan for the Idaho National Engineering and Environmental Laboratory Remediation Program* (LMITCO 1998), the Quality Assurance Project Plan (QAPjP) (DOE-ID 2000b), this HASP, and the applicable field sampling plan (FSP), as required.

The PM is responsible for the overall work scope, schedule, and budget and reporting to affected stakeholders such as DOE-ID and state/federal environmental regulatory agencies. The PM is responsible for (a) developing resource-loaded, time-phased control account plans based on the project technical requirements, budgets, and schedules and (b) assigning project tasks. The PM coordinates all document preparation, field, laboratory, and modeling activities. The PM will implement the project requirements and ensure work is performed as planned for the project.

The PM will ensure that an employee job function evaluation (Form 340.02) is completed for all BBWI project employees, reviewed by the project IH for validation, and then submitted to the Occupational Medical Program (OMP) for determination of whether a medical evaluation is necessary.

Other functions and responsibilities of the PM include

- Developing the documentation required to support the project

- Ensuring the technical review and acceptance of all project documentation

- Developing the site-specific plans required by the ER program, such as work plans, ES&H plans, and FSPs (as required)

- Ensuring that project activities and deliverables meet schedule and scope requirements, as described in the FFA/CO, Attachment A, "Action Plan for Implementation of the Federal Facility Agreement and Consent Order" (DOE-ID 1991), and applicable guidance

- Identifying the requirements for, scheduling for, and supporting the CERCLA and NEPA public review and comment process

- Ensuring that the hazards checklists and JSAs are completed, as required by PRD-25, "Activity Level Hazard Identification, Analysis, and Control"

- Identifying the subproject technology needs

- Coordinating and interfacing with the units within the program support organization on issues relating to quality assurance (QA), ES&H, and NEPA support for the project

- Coordinating the site-specific data collection, review for technical adequacy, and data input to an approved database, such as the Environmental Restoration Information System (ERIS)

- Coordinating and interfacing with construction management to ensure milestones are met, adequate management support is in place, technical scope is planned and executed appropriately, and project costs are kept within budget.

2.3.3 ER WAG 3 SH&QA Point of Contact

The ER WAG 3 safety, health, and quality assurance (SH&QA) point of contact (POC), or designee, is responsible to manage SH&QA resources to ensure that SH&QA programs, policies, standards, procedures, and mandatory requirements are implemented in all WAG 3 day-to-day operations. The WAG 3 SH&QA POC directs SH&QA compliance activities by providing technical and administrative direction to project staff and through coordination with related INTEC SH&QA personnel. The WAG 3 SH&QA POC reports directly to the WAG 3 manager. The WAG 3 SH&QA POC represents the WAG 3 manager in all SH&QA matters including planning, compliance, and oversight of project activities at INTEC CERCLA sites.

Note: The ER SH&QA POC will ensure that the appropriate SH&QA personnel participate in the development and review of the hazards profile screening checklist in accordance with PRD-25, STD-101, and any subsequent JSA development.

2.3.4 ER Environmental Manager

The ER environmental manager will assign an environmental compliance specialist who will oversee, monitor, and advise the PM and FCC, who are performing site activities, on environmental issues and concerns by ensuring compliance with DOE orders, EPA regulations, and other regulations concerning the effects of site activities on the environment. The project environmental representative provides support surveillance services for hazardous waste storage, transport, and surface water/storm water runoff control.

2.3.5 Fire Protection Engineer

The assigned fire protection engineer reviews the work packages, conducts preoperational and operational fire hazard assessments (as required), and is responsible for providing technical guidance to site personnel regarding all fire protection issues.

2.3.6 Quality Engineer

A quality engineer (QE) provides guidance on the task-site quality issues, when requested. The QE may periodically observe task site activities and verify that site operations comply with quality requirements pertaining to these activities. The QE will determine the quality level and prepares inspection criteria for materials procured in support of the SSSTF construction, as required.

2.3.7 Quality Inspectors

Quality inspectors complete inspections identified in the construction quality inspection plan and/or work order. The inspectors report directly to the assigned quality engineer for direction and assignment of duties and responsibilities.

3. RECORDKEEPING REQUIREMENTS

3.1 Industrial Hygiene and Radiological Monitoring Records

The IH will record airborne monitoring and/or sampling data (both area and personal) and input the information into the Hazards Assessment and Sampling System (HASS) if required to be collected. All monitoring and sampling equipment shall be maintained and calibrated or operation/response checks conducted prior to use per BBWI procedures and the manufacturer's specifications. Industrial hygiene airborne monitoring and sampling data are treated as limited access information and maintained by the IH per procedures in BBWI safety and health manuals (Safety and Health Department 2002a,b).

The RCT maintains radiological monitoring records on daily site operational activities and instrument operation/response checks where instruments were used to document detection levels or conduct field screening of samples. Radiological monitoring records are maintained according to the *INEEL Radiological Control Manual* (Radiological Control Department 2000) and MCP-9, "Maintaining the Radiological Logbook."

Construction personnel, or their labor representative, have a right to both IH and RCT monitoring and sampling (both area and personal) data. Results from monitoring will be communicated to all field personnel during POD meetings and formal pre-job briefings, in accordance with MCP-3003, "Performing Pre-Job Briefings and Post-Job Reviews."

The Subcontractor must submit a written exposure monitoring plan prior to beginning project field work. Subcontractors shall provide BBWI initial sampling results within 24 hours of laboratory analysis receipt and/or direct reading results through vendor data submittals. A written exposure monitoring report for all sampling activities must be forwarded to BBWI from the subcontractor within 5 working days of analysis receipt which must include sampling methods, sampling results, levels compared with applicable standards, and actions necessary to mitigate/eliminate present and future subcontract employee exposure.

3.2 FCC Logbook and Site Attendance Record

The FCC will keep a record of daily task-site events in the FCC logbook and will ensure an accurate record of all personnel (workers and nonworkers) who enter the construction area each day in a site attendance logbook. The site attendance logbook must be obtained from Administrative Record and Document Control (ARDC). Completed logbooks are submitted to the ARDC, along with other documents at the project's completion. Logbooks will be maintained in accordance with MCP-231, "Logbooks for ER and D&D&D Projects."

A separate sampling logbook will be kept for soil sampling activities (if required). This must be obtained from ARDC. Completed sampling logbooks are submitted to the ARDC, along with other documents at the project's completion. Logbooks will be maintained in accordance with MCP-231, "Logbooks for ER and D&D&D Projects."

The site attendance logbook must note all personnel who access the project site, and the logbook will be used to conduct accountability in case of a site evacuation. Section 11 provides additional information regarding personnel accountability requirements.

3.3 Administrative Record and Document Control Office

The ARDC office shall organize and maintain data and reports generated by field activities. The ARDC office maintains a supply of all controlled documents and provides a documented system for the control and release of controlled documents, reports, and records. Copies of project plans, this HASP, the quality program plan, the QAPjP, and other documents pertaining to this work are maintained in the project file by the ARDC office. All project records and logbooks, except IH and RCT logbooks, must be forwarded to the ARDC office within 30 days after completion of field activities.

4. PERSONNEL TRAINING

All construction site personnel shall receive training as specified in OSHA, 29 CFR 1926.65, and the BBWI safety and health manuals (Safety and Health Department 2002a,b). Radiation workers shall be trained according to the *INEEL Radiological Control Manual* (Radiological Control Department 2000) and PDD-1073, "Radiological Control Training And Qualification Program." Table 4-1 summarizes the SSSTF site-specific training requirements for construction personnel. Training requirements for personnel requiring access to the project site may vary depending on the hazards associated with their individual job assignment and required access into established controlled work areas. Table 4-1 lists only project-specific training and does not include all potential INTEC or other general BBWI training that may be required for personnel.

4.1 General Training

Proof that all required site-specific training has been completed (including applicable refresher training) must be maintained at the project site or be available electronically (e.g., on the TRAIN [Training Records and Information Network]). Examples of acceptable written training documents include "40 Hour OSHA HAZWOPER Card," "Respirator Authorization Card," "DOE Certificate of Core Radiological Training II Card," "Medic/First Aid Training Card," and/or a copy of an individual's or department's (BBWI personnel only) TRAIN system printout demonstrating completion of training. For construction subcontractor personnel, a copy of a certificate/card issued by the institution where the site-specific required training was received is also acceptable proof of training. The DOE radiological worker training must include INEEL site-specific training.

4.2 Site-Specific Project Training

Before beginning work at the SSSTF construction site, site-specific HASP training will be conducted by the HSO or designee. This training will consist of a complete review of a controlled copy of the project HASP and attachments, applicable JSAs, SWPs (if required), work order, and other applicable work control/authorization documents with time for discussion and questions. Site-specific training can be conducted in conjunction with or separately from the required formal pre-job briefing (MCP-3003).

Access to the construction site requires ordnance awareness training ("Unexploded Ordnance Recognition Training," 00TRN-803) for all individuals. The training provides information on necessary actions if ordnance or discolored soils are encountered. The SSSTF construction area will have a comprehensive ordnance survey completed prior to beginning construction activity. Discolored or stained soils identified during the ordnance investigation will be isolated and investigated prior to disturbance.

At the time of site-specific HASP training, personnel training records will be checked and verified to be current and complete for all required training shown in Table 4-1. Once the HSO or designee has completed site-specific training, personnel will sign a Form 361.47, "HWO Supervised Field Experience Verification," or equivalent indicating that they have received this training; understand the project tasks and associated hazards/mitigation; and agree to follow all HASP and all other applicable work control and safety requirements. (Form 361.47 or equivalent training forms are available on the INEEL Intranet under "Forms").

The FCC or HSO will monitor each newly 24-hr or 40-hr trained worker's performance to meet the 1 day or 3 days of supervised field experience, respectively, in accordance with 29 CFR 1926.65(e). A Form 361.47 or equivalent will then be completed by the HSO/FCC to document the supervised field experience.

Note 1: Supervised field experience is only required if the worker has not previously completed this training (documented) at another CERCLA site or the worker is upgrading from 24-hr to 40-hr HAZWOPER training. A copy must be kept at the project site or electronically as evidence of training.

Note 2: Completed training project forms (Form 361.47 or equivalent) must be submitted to the ER training coordinator for inclusion in the TRAIN system within 5 working days of completion.

Table 4-1. Required site-specific project training for SSSTF construction project.

Training	FCC & HSO	Construction Personnel	Occasional Site Workers[a] and Visitors Requiring Access into the Construction Area	Laydown and Support Area Only
40-hr HAZWOPER[b]	Y	Y		
24-hr HAZWOPER			Y[c]	
8-hr HAZWOPER refresher (as applicable)	Y	Y	Y	
HAZWOPER supervisor	Y	Construction Superintendent only		
Unexploded Ordnance Recognition Training, 00TRN-803	Y	Y	Y	Y
Site-specific HASP training[d]	Y	Y	Y	Y[e]
Job Safety Analysis (JSA) training	Y	Y	Y	Y[e]
DOE RW II with INEEL site-specific (except RCTs)[f]	Y[f]	Y[f]	Y[f]	
CPR/medic first aid[g]	Y	Y[h]		
Respirator training[i]	Y	Y	Y	
HAZMAT employee general awareness		Samplers only		
Area warden training	Y			
Construction orange card	Y[j]	Y	Y[j]	Y[j]
INEEL Pollution Prevention Awareness (00TRN60)	Y	Y	Y	Y
LO/TO for Authorized Employees – Limited (00TRN663)		Y		
LO/TO for Simulator Training (QLLTWORK)		Y		
Excavation Competent Person (0TRNV105)		Y		
Confined Space Entrant/Attendant/Supervisor Qual (00TRN183)	Y	Y		
Comp Person Fall Prot Qual (000TRN1)	Y	Y		
Fire Watch Training (00TRN126)		Y		
Portable Ladders (SMTT0006)		Y		
Use of Personal Protective Equipment (00TRN288)	Y	Y	Y	Y
Pre-job briefings and post-job reviews (00TRN732)	Y			

Training	FCC & HSO	Construction Personnel	Occasional Site Workers[a] and Visitors Requiring Access into the Construction Area	Laydown and Support Area Only
Pre-job briefing Performance Evaluation (00TRN754)	Y			
Hantavirus (SMTT0008)	Y	Y	Y	Y
Heat Stress Training (00TRN606)	Y	Y	Y	Y
Working in Hazardous Temperatures - Cold Stress (SMTT0010)	Y	Y	Y	Y
Hearing Conservation Training (00TRN32)	Y	Y	Y	Y
Fall Protection At Risk Worker (00TRN57)	Y	Y		

Note: Shaded fields indicate specific training is not required.

a. Occasional site workers typically include lower-tier construction subcontractors onsite to perform limited activities in low hazard areas. HAZWOPER training requirements will be dependent upon the area to be accessed and associated safety and health hazards.

b. 40-hr HAZWOPER required training will also include an additional 24 hr of HAZWOPER supervised field experience as required by 29 CFR 1926.65(e). This field experience, for this project, will be documented on Form 361.47 (or equivalent).

c. Minimum requirements for construction area access. 40-hr HAZWOPER training may be required depending on the nature of the tasks being performed and associated health and safety hazards.

d. Includes project-specific HAZCOM, site-access/security, decontamination, and emergency response actions as required by 29 CFR 1926.65(e).

e. Or general hazard briefing to identify construction boundaries, safety and health hazards, and emergency response actions.

f. During excavation and sampling tasks or in any area posted as a soil contamination area. No access will be allowed in any established contamination areas without RWII training and a radiological work permit.

g. At least two CPR/medic first aid (or equivalent) -trained personnel must be onsite during construction activities.

h. Appropriate number must be trained to meet g.

i. Full-face air purifying respirators (APRs) to be worn only if airborne contaminant levels exceed the action limits (Table 8-5).

j. Or blue card training for individuals not assigned to the INEEL construction organization or construction subcontractors.

4.3 Daily Plan-of-the-Day Briefing and Lessons Learned

A POD meeting will be conducted by the STR, FCC, construction subcontractor superintendent or designee, with other project personnel contributing (including the HSO and the RCT, as applicable). During this meeting, daily tasks are to be outlined, hazards identified, hazard controls/mitigation and work zones reviewed, PPE requirements discussed, and employees' questions answered. At the end of this meeting, any new work control documents will be read and signed (e.g., SWPs, RWPs, JSAs). Particular emphasis will be placed on lessons learned from the previous days' activities and how tasks can be completed in the safest, most efficient manner. All personnel will be asked to contribute ideas to enhance worker safety, mitigate potential exposures at the project sites, and contribute to lessons learned. The POD meeting will be conducted as an informal meeting, and the only required record will be to document the completion of the POD meeting in the FCC logbook.

Note: If a pre-job briefing is conducted in accordance with MCP-3003, then a POD is not required for that day's activities.

5. OCCUPATIONAL MEDICAL SURVEILLANCE PROGRAM

BBWI site personnel shall participate in the INEEL OMP, as required by DOE Order 440.1A and OSHA, 29 CFR 1926.65. Medical surveillance examinations will be provided (a) before assignment, (b) annually, and (c) after termination of hazardous waste site duties or employment. This requirement includes personnel who are or may be exposed to hazardous substances at or above the OSHA permissible exposure limit (PEL) or published exposure limits, without regard to respirator use, for 30 or more days per year. Personnel who wear a respirator in performance of their job or who are required to take respirator training to perform their duties under this plan must participate in the medical evaluation program for respirator use at least annually as required by 29 CFR 1910.134.

A single copy of the HASP for the SSSTF construction, job hazard analysis, required PPE, confined space entry (as applicable), and other exposure-related information shall be made available by the PM to an OMP physician (and subcontractor physicians) conducting medical surveillance for employees participating in this project (upon request). Exposure monitoring results and hazard information furnished to the OMP physician must be supplemented or updated annually as long as the employee is required to maintain a hazardous waste/hazardous material employee medical clearance.

Note 1: Project management shall ensure that an Employee Job Function Evaluation (Form 340.02) is validated by the project IH and then submitted to the OMP for review before any BBWI employee begins work on the project.

Note 2: BBWI employees shall not be permitted to work on the project until the OMP has sent a medical clearance to management or the IH has validated that no potential exists for exposure above the established action levels and that no additional substance-specific medical evaluations are required.

The OMP physician shall evaluate the physical ability of a BBWI employee to perform the work assigned, as identified in the site HASP or other job-related documentation. A documented medical clearance (physician's written opinion) will be provided to the employee and line management stating whether the employee has any detected medical condition that would place him/her at increased risk of material impairment of his/her health from work in hazardous waste operations, emergency response, respirator use, and confined space entry (as applicable). The physician may impose restrictions on the employee by limiting the amount and/or type of work performed. The OMP responsibilities, with regard to personnel assigned to hazardous waste site activities, include, but are not limited to, the following:

- Providing current comprehensive medical examinations (as determined by the examining physician) at an INEEL medical facility for full-time personnel
- Obtaining records/reports from employee's private physicians, as required by the OMP director
- Performing a medical evaluation on return-to-work cases following an absence in excess of 1 work week (40 consecutive work hours) resulting from illness or injury
- Conducting a medical evaluation in the event that management questions the ability of an employee to work or if an employee questions his/her own ability to work.

The attending physician will evaluate all information provided, including medical questionnaires, physical exam findings, blood chemistry and urinalysis results, preexisting medical conditions, nature of work to be performed, actual and potential hazards and exposures, and other factors deemed appropriate by the physician for determining the following for each employee:

- Ability to perform relevant occupational tasks
- Ability to use respiratory protection
- Ability to work in other PPE and heat/cold stress environments
- Requirement for entry into substance-specific medical surveillance programs.

If the OMP does not have sufficient information to complete a medical evaluation before respirator training, the employee's supervisor will be notified. The employee will not be permitted to fit test until the needed information is provided and any additional examination or testing is completed.

5.1 Construction Subcontractor Personnel

Construction subcontractor project personnel shall participate in a subcontractor medical surveillance program that satisfies the requirements of OSHA, 29 CFR 1926.65. This program must make available medical examinations (a) before assignment, (b) annually, and (c) after termination of hazardous waste duties. The physician's written opinion will serve as documentation that subcontractor personnel are fit for duty.

Medical data from the subcontractor employee's private physician, collected pursuant to hazardous material worker qualification, shall be made available to the BBWI OMP physicians, upon request. A subcontractor employee's past radiation exposure history must be submitted to the BBWI radiation dosimetry and records section, in accordance with the *INEEL Radiological Control Manual* (Radiological Control Department 2000) and MCP-188, "Issuance of Thermoluminescent Dosimeters and Obtaining Employees Dose History."

5.2 Injuries on the Site

It is policy that a BBWI OMP physician examine all injured personnel if injured on the job, if an employee is experiencing signs and symptoms consistent with exposure to a hazardous material, or if there is reason to believe that an employee has been exposed to toxic substances, or physical or radiological agents, in excess of allowable limits.

Note: Construction subcontractor employees will be taken to the closest INEEL medical facility (CFA-1612) to have an injury stabilized, or occupational exposure evaluated, before transport to the subcontractor's treating physician or medical facility.

In the event of a known or suspected injury or illness due to exposure to a hazardous substance, or physical or radiological agent, the employee(s) shall be transported to the INEEL medical facility (CFA-1612) for evaluation and treatment, as necessary.

The HSO or FCC is responsible for obtaining as much of the following information as is available to accompany the individual to the medical facility:

- Name, job title, work (site) location, and supervisor's name and phone number
- Substance(s), physical or radiological agent(s) exposed to (known or suspected), material safety data sheet (MSDS), if available
- Nature of the incident, injury, or exposure and related signs or symptoms of exposure
- First aid or other measures taken
- Locations, dates, and results of any airborne exposure monitoring and/or sampling
- PPE in use during this work (for example, type of respirator and cartridge used).

Further medical evaluation will be conducted by the treating/examining physician, according to the signs and symptoms observed, hazard involved, exposure level, and specific medical surveillance requirements established by the OMP director, in compliance with 29 CFR 1926.65.

The INTEC SS will be contacted if any injury or illness occurs at the SSSTF construction project site. As soon as possible after an injured employee has been transported to the medical facility, the FCC or designee will make notifications, as indicated in Section 11 of this HASP.

RadCon personnel will evaluate all actual and/or suspected abnormal radiological exposures in excess of allowable limits and will establish the follow-up actions. For internal uptakes (as calculated committed effective dose equivalent values), INEEL engineering design file EDF-INEL003, "Established Levels of Radionuclide Intake for Consideration of Medical Intervention," will be used as the basis for this evaluation and follow-up actions. All wounds will be examined by an OMP physician to determine the nature and extent of the injury. The physician will determine if the wound can be bandaged adequately for entry into a radiologically controlled area, in accordance with Article 542 of the *INEEL Radiological Control Manual* (Radiological Control Department 2000).

5.3 Substance-Specific Medical Surveillance

SSSTF construction activities will be conducted in an area outside the INTEC facility fence (Figure 1-2) adjacent to the ICDF. This area is not posted as a radiologically controlled area or CERCLA site, but it is within an ECA based on potential windblown radiological contamination from INTEC. Radiological surveys will be conducted, as deemed appropriate by RadCon personnel during initial excavation tasks, as a precautionary measure to ensure radiological contamination is not detectable above unrestricted release criteria in accordance with MCP-425, "Surveys of Materials for Unrestricted Release and Control of Movement of Contaminated Material."

Based on the location of the construction area (outside INTEC fence line) and minimal potential for exposure above the action limits **no OSHA-mandated substance-specific medical surveillance requirements apply**. If new contaminants of concern are identified during the course of the SSSTF construction project, exposures will be evaluated and quantified to determine if an OSHA substance-specific standard applies.

6. ACCIDENT PREVENTION PROGRAM

The SSSTF construction project presents primarily industrial safety and physical hazards to personnel conducting the construction tasks. It is important that all personnel understand and follow the site-specific requirements of this HASP. Hazard isolation, delineated work areas, work practices, and the use of PPE will be implemented to eliminate or mitigate all potential hazards and exposures. However, every person on the site is responsible for the identification and control of hazards.

6.1 Voluntary Protection Program and Integrated Safety Management

BBWI's safety processes embrace the VPP and ISMS criteria, principles, and concepts as part of operational excellence. All levels of management are responsible for implementing safety policies and programs and for maintaining a safe and healthful work environment. Construction personnel are expected to take a proactive role in preventing accidents, ensuring safe working conditions for themselves and fellow personnel, and complying with all work control documents and procedures.

ISMS is focused on the **system** side of conducting operations, and **VPP** concentrates on the **people** aspect of conducting work. They both define work scope, identify and analyze hazards, and mitigate the hazards. The VPP is a process that promotes and encourages continuous safety improvement but is not a requirement of any regulatory agency. BBWI and construction subcontractors participate in VPP and ISM for the safety of their employees. Additional information regarding BBWI's VPP and ISMS programs can be found in PDD-1005, "Site Operations." The five key elements of VPP and ISM are

VPP	ISMS
Management Leadership	Define Work Scope
Employee Involvement	Analyze Hazards
Work Site Analysis	Develop/Implement Controls
Hazard Prevention and Control	Perform Work Within Controls
Safety and Health Training	Provide Feedback/Improvement

6.2 General Safe-Work Practices

The following practices are mandatory for all BBWI and construction subcontractors performing SSSTF construction tasks. All site visitors entering the construction area must follow these requirements. Failure to follow these practices may result in permanent removal from the site and other disciplinary actions. The PM, FCC, and HSO are responsible for ensuring these hazard control practices are followed at the site:

- Construction site access is allowed to authorized BBWI, subcontractor, and authorized visitor personnel only in accordance with PRD-1007, "Work Coordination and Hazards Control."

- Project personnel shall have the authority to initiate STOP WORK actions. PRD-1004, "Stop Work Action," shall be used.

- Project personnel shall not eat, drink, chew gum or tobacco, smoke, apply cosmetics/sunscreen, or perform any other practice that increases the probability of hand-to-mouth transfer and ingestion of materials beyond the support zone at the construction site.

- Project personnel shall be aware of and comply with all safety signs, color codes, and barriers. Project personnel shall adhere to PRD-2022, "Safety Signs, Color Codes, and Barriers." PRD 2022 "Safety Signs, Color Codes, and Barriers" lists the colors yellow and magenta for radiological signs. However, the *INEEL Radiological Control Manual*, Sec. 231, allows the use of black lettering and symbol on yellow background for radiological signs (Radiological Control Department 2000). The signs used at INEEL are black on yellow. (Barriers are magenta and yellow.)

- Project personnel shall be alert for dangerous situations, strong or irritating odors, airborne dusts or vapors, and spills that may be present. Project personnel shall report all potentially dangerous situations to the FCC and/or HSO.

- Project personnel shall avoid direct contact with potentially contaminated soil (if applicable). Personnel shall not walk through spills or other areas of contamination and shall avoid kneeling, leaning, or sitting on equipment or surfaces that may be contaminated.

- Project personnel shall be familiar with the physical characteristics of the site, including, but not limited to

  - Wind direction
  - Accessibility of fellow personnel, equipment, and vehicles
  - Communications at the site and with INTEC
  - Areas of potential soil contamination (if detected)
  - Major roads and means of access to and from the site
  - Nearest water sources and fire fighting equipment
  - Warning devices and alarms
  - Capabilities and location of nearest emergency assistance.

- Project personnel shall report all broken skin or open wounds to the HSO and/or FCC. A BBWI OMP physician will determine if the wound presents a significant risk of internal chemical or radiological exposure. The OMP physician will consider how the wound can be bandaged and will recommend PPE to be worn by the injured employee. **Personnel with unprotected wounds shall not be permitted to enter chemical or radiological contaminated areas nor shall they handle contaminated or potentially contaminated materials at the site without having been examined by a BBWI OMP physician.**

- Project personnel shall prevent releases of hazardous materials, including those used at the site. If a spill occurs, personnel must try to isolate the source (if possible and if this does not create a greater exposure potential) and then report it to the FCC and/or HSO. The INTEC shift supervisor (SS)

will be notified and additional actions will be taken, as described in Section 11. Appropriate spill response kits, or other containment and absorbent materials, will be maintained at the site.

- Project personnel will ensure that electrical equipment, wiring, cables, switches, and current overload protection meet applicable regulations and are maintained in a manner that provides protection for project personnel from shock hazards, injury, and prevents property damage in accordance with PRD-2011, "Electrical Safety." Ground-fault protection will be provided whenever electrical equipment is used outdoors.

- Project personnel shall keep all ignition sources at least 15 m (50 ft) from explosive or flammable environments and use non-sparking, explosion-proof equipment, if advised to do so by a SE.

- Project personnel who wear contact lenses shall comply with PRD-2001, "Personal Protective Equipment."

- Project personnel shall meet additional requirements and PRDs identified in the subcontract specifications and special conditions.

6.3 ALARA Principles

The SSSTF falls within an ECA, but this area is not posted as a radiologically controlled area. Contamination surveys will be conducted during initial excavation activities and as deemed appropriate by RadCon personnel throughout the construction project to confirm that no contamination is present. If radiological contamination is detected in soils to be excavated at the construction site, then appropriate radiological controls will be implemented and the area posted. If radiological contamination is encountered, as low as reasonably achievable (ALARA) principles will be followed during all construction activities within the affected area. **Unplanned and preventable exposures or uptakes are considered unacceptable**. All project tasks will be evaluated with the goal of eliminating or minimizing personnel radiation exposure and contamination.

6.3.1 External Radiation Dose Reduction

If radiation fields are encountered that exceed radiation area criteria during construction tasks, construction activities will halt until an RWP can be written and the area posted with the applicable radiological control signs and barriers in accordance with MCP-7, "Radiological Work Permit." Also, RadCon personnel will participate in the pre-job briefing to ensure all project personnel understand the dose rate limits and limiting conditions on the RWP.

Basic protective measures used to reduce external doses include (1) minimizing time in radiation areas, (2) maximizing the distance from known sources of radiation, and (3) using shielding. If written, the RWP will define hold points, required dosimetry, RCT coverage, radiological control areas, and radiological limiting conditions. All personnel will be required to read and acknowledge the RWP requirements as well as attend the mandatory pre-job briefing prior to being allowed to sign the RWP (or scan the bar code) and receive electronic dosimetry.

6.3.2 Internal Radiation Dose Reduction

If contamination or airborne radioactivity are encountered, monitoring for contamination during construction tasks will be conducted using hand-held instruments and monitoring for airborne radioactivity performed in accordance with MCP-357, "Job-Specific Air Sampling/Monitoring," and as deemed appropriate by RadCon personnel.

An internal dose may result from radioactive material being taken into the body. Radioactive material can enter the body through inhalation, ingestion, absorption through wounds, or injection from a puncture wound. Reducing the potential for radioactive material to enter the body is critical to avoid internal dose. If contamination is encountered, potential internal uptakes will be minimized by planning all construction tasks, utilizing engineering controls (where feasible) and procedures, using standardized sampling procedures and controls, and wearing protective clothing and respiratory protection (as the final control measure).

6.4 Nonradiological Contaminant Exposure Avoidance

The SSSTF will be within CPP-95, which is from the windblown plume consisting of areas outside the current INTEC perimeter fence that are potentially contaminated as a result of wind dispersion of radionuclides from facility operations. The area delineated as CPP-95, (i.e., the WAG 3 AOC) is shown in Figure 1-10 of the OU 3-13 ROD. Surveys and soil sampling were conducted as part of the OU 10-06 remedial investigation (RI) and engineering evaluation/cost analysis. Based on this, there is no reason to suspect that nonradiological contaminants will be encountered during construction activities (DOE 1999). The primary potential for exposure will be from chemicals brought to the project site for construction. Construction subcontractors will be required to have an MSDS for all chemicals used on the construction site and submit these to BBWI in accordance PRD-2101, "Hazard Communication," and with applicable contractual general and special conditions.

For chemicals used at the project site, exposures will be evaluated by the IH to evaluate usage and appropriate controls. Threshold limit values (TLVs) will be used (as applicable) for evaluating airborne and skin exposure to these chemicals and materials. TLVs represent levels and conditions under which it is believed that nearly all workers may be exposed day after day without adverse health effects. Based on these TLVs, more conservative specific action limits have been established (Table 8-5) to further limit the potential for approaching these contaminant TLVs.

6.5 The Buddy System

The two-person or "buddy system" will be used at the site when construction personnel have entered into the established construction area. The buddy system requires workers to assess and monitor their buddy's mental and physical well-being during the course of the work day. A buddy must be able to

- Provide assistance
- Verify the integrity of PPE (when required)
- Observe their buddy for signs and symptoms of heat stress, cold stress, or contaminant exposure
- Notify other personnel in the construction area if emergency assistance is needed.

7. SITE CONTROL AND SECURITY

SSSTF construction activities will take place within the WAG 3 AOC which will require the area to be delineated as a CERCLA area until the area is found to be contamination-free during excavation or other soil disturbance activities. The SSSTF utilities tie-in is part of the RD/CWP (DOE-ID 2002) activities and includes working inside site ECA CPP-88 at INTEC. The SSSTF is within CPP-95 which is from the windblown plume consisting of areas outside the current INTEC perimeter fence that are potentially contaminated as a result of wind dispersion of radionuclides from facility operations. HAZWOPER-defined work zones and radiological control areas will established and entry into and exit out of the CERCLA area will be controlled through the appropriate use of barriers, signs, and other measures that are described in detail in this section and in accordance with PRD-2022, "Safety Signs, Color Codes, and Barriers." Personnel not directly involved with construction activities shall be prohibited from entering the CERCLA construction area. Occasional site workers and visitors, such as inspectors, may be authorized to enter the established construction area provided they are conducting official business, authorized by the HSO, have met all the site-specific training requirements for the area, and have a demonstrated need to access (as listed on Table 4-1 of this HASP and as posted).

Note: Visitors may not be allowed into the construction area during certain construction tasks to minimize safety or health hazards or as an ALARA consideration (if contamination is encountered). The determination as to any visitor's demonstrated "need" for access into the construction area or other established work areas/zones versus the hazards will be made by the HSO in consultation with RadCon personnel, as applicable.

Figure 7-1 illustrates the construction area that will be established for SSSTF construction activities. Figure 7-2 illustrates the general configuration of the controlled work zones that would be established if contamination was encountered during excavation or other construction tasks. These figures represent the general configuration of the area and are not intended to provide an exact layout, position of all equipment, or area/zone sizes. All zones illustrated will be established (as required), however, changing field conditions may warrant reconfiguring the layout, size, and orientation of these controlled areas. Changes in zone configuration and size will be the decision of the HSO, in conjunction with the IH, RCT, and FCC, based on the IH exposure assessment, site characterization, and RadCon radiological evaluations. These changes will not require modification or revision of this document.

Both potential radiological and nonradiological hazards (including industrial safety hazards) will be evaluated when delineating the initial construction area and contingency HAZWOPER zone locations and size. If required, common barriers may be used to delineate both radiological and nonradiological work-zone postings, depending on the nature and extent of contamination. If common barriers are used, they will be posted according to both sets of requirements (29 CFR 1926.65 and 10 CFR 835) using appropriate colored rope and postings. These zones may change in size and location as project tasks evolve, based on site monitoring data, and as wind direction changes. Additionally, entrances and egress points may change based on these same factors.

If radiologically controlled areas are required, they will be established by RadCon personnel, in accordance with the *INEEL Radiological Control Manual* (Radiological Control Department 2000) and MCP-187, "Posting Radiological Control Areas."

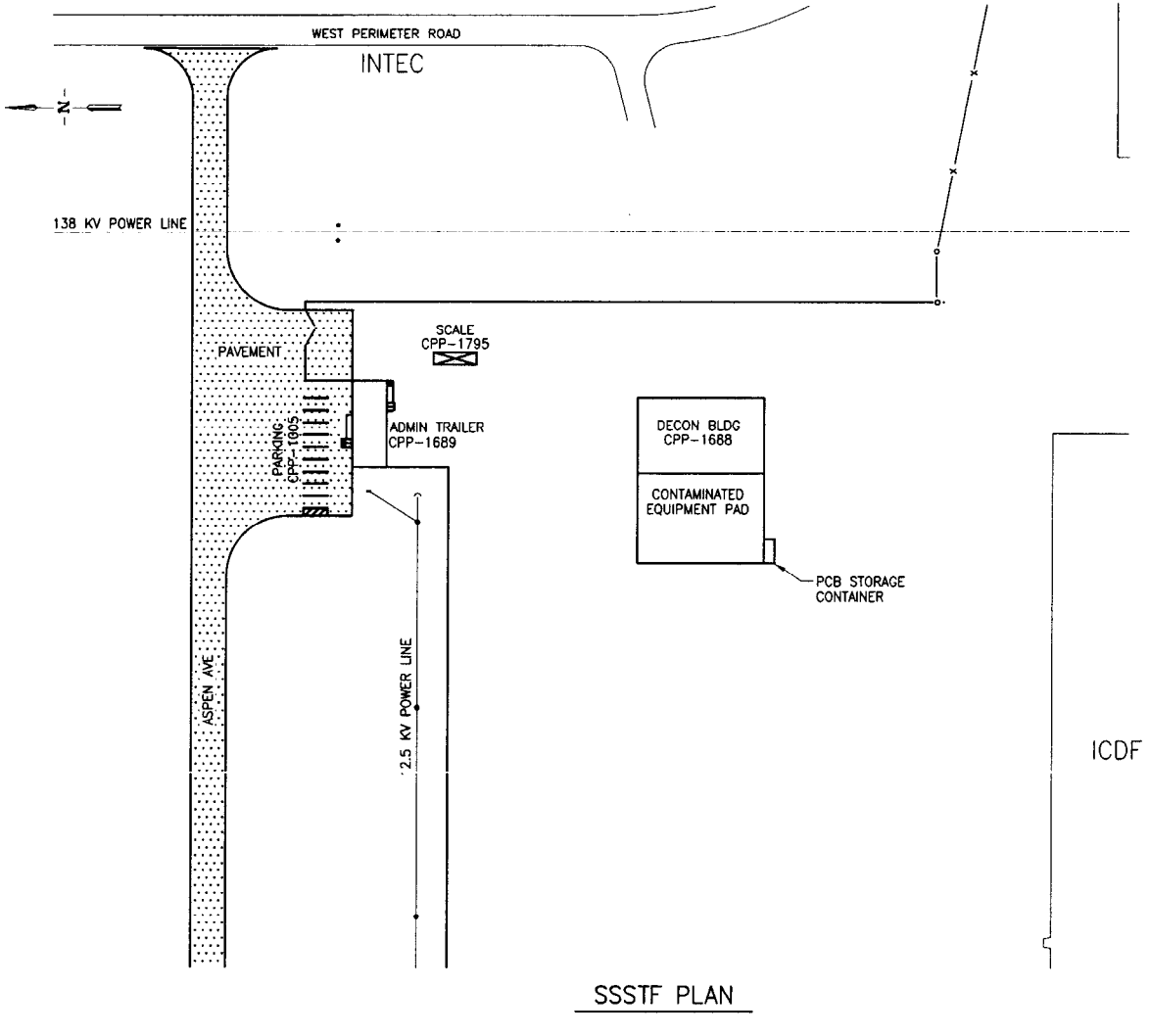

Figure 7-1. General configuration of the SSSTF.

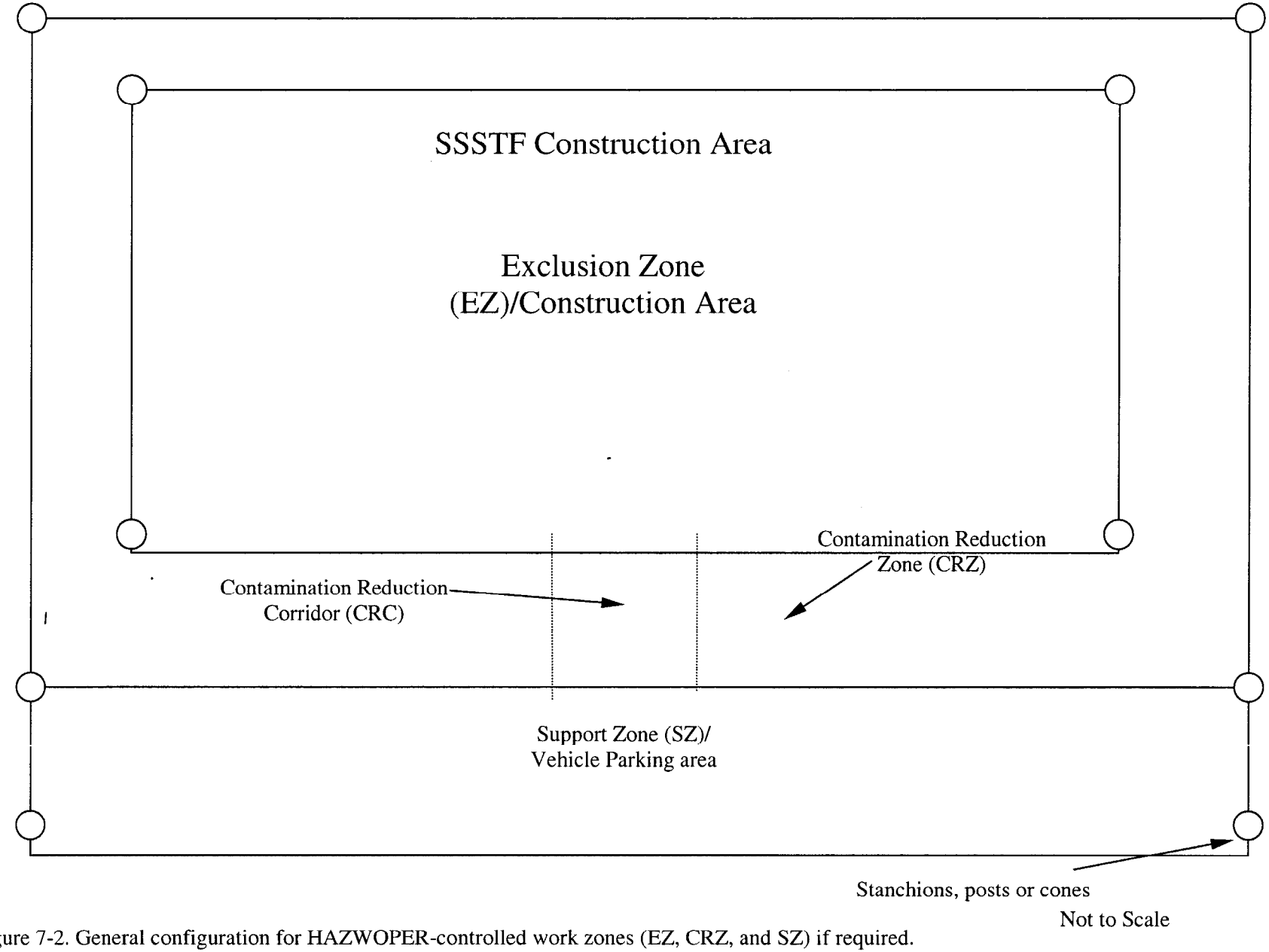

Figure 7-2. General configuration for HAZWOPER-controlled work zones (EZ, CRZ, and SZ) if required.

7.1 Support Zone

If required to be delineated, the SZ will be located outside the CRZ in an upwind direction of the EZ (where possible) and readily accessible to the nearest road (where practical). The SZ is an area outside the CRZ and (if required) may be delineated using stanchions, cones, existing fence, or equivalent material to prevent visitors from entering the area and/or inadvertently entering a more restrictive work zone (e.g., CRZ or EZ).

Support facilities (e.g., vehicle parking, additional emergency equipment, extra PPE, and stored monitoring and sampling equipment) may be located in the SZ. Visitors who do not have appropriate training and or have not received site-specific training will be restricted to the SZ.

The construction area postings will be maintained during off-hours and weekends. This area will remain intact until all site tasks have been completed and equipment and supplies have been removed from the construction site. If required to be established, the HSO and RCT will ensure that site HAZWOPER zones and radiologically controlled areas are posted and intact when leaving the site, and they will be responsible for breaking down the zones when site activities have been completed.

Access beyond the support zone will be signed with the following at a minimum:

- CAUTION; CERCLA/OSHA; 1910.120 Hazwoper Controlled Area; Authorized Personnel Only; Health and Safety Plan Controlled Area; No Eating, Drinking, Chewing, Smoking, or Application of Cosmetics
- CAUTION; CONSTRUCTION AREA – Hard Hats, Safety Glasses, and Steel Toe Boots Required; Hearing Protection Required When Equipment is Operating
- FOR PROJECT INFORMATION CONTACT THE FOLLOWING PERSONNEL, or equivalent signage.

Note: Only RadCon personnel can post and remove RadCon postings. This will be accomplished in accordance with the INEEL *Radiation Protection Manual* and MCP-187, "Posting Radiological Control Areas."

7.2 Contamination Reduction Zone and Corridor

If required to be established, the project CRZ and CRC will serve as transition areas surrounding the EZ and will be located between the EZ and SZ (Figure 7-2). The CRZ and CRC will serve to buffer and further reduce the probability of the SZ becoming contaminated. All project personnel and equipment entering and exiting the EZ will transition through the CRC. The size and location of the CRC will change frequently and will be communicated to field team members but will not be formally delineated.

Note: If radiological contamination or radiation is detected at levels requiring the generation of an RWP, then construction work in the affected area will halt until a RWP is written.

The project IH will be responsible for nonradionuclide contamination issues and determining the most appropriate decontamination methods, as described in Section 10. A designated portion of the CRC may be established for the nonradionuclide decontamination of equipment (if required). All decontamination supplies (nonradionuclide decontamination solution, Teri wipes®, etc.), used nonradiological PPE, and debris waste containers may be located in the CRC.

7.3 Exclusion Zone

If required to be established, the EZ will be large enough to encompass the construction or affected subsection of the construction area. If a radiologically controlled area is established, it will be within the EZ. The minimum number of personnel required to safely perform the construction tasks will be allowed into the EZ. The EZ is a controlled access zone at all times. An entry and exit point will be established at the periphery of the EZ/CRC to regulate the flow of personnel and equipment. The EZ boundary will be delineated with rope, printed hazard ribbon, or equivalent. All personnel who enter the EZ will wear the appropriate level of PPE for the degree and type of hazards present.

Factors that will be considered when establishing the EZ boundary includes air monitoring data, radionuclide-contamination data, radiation fields, equipment in use, the physical area necessary to conduct site operations, and the potential for soil contaminants to migrate from the area. The boundary may be expanded or contracted, as this information becomes available, based on the aforementioned evaluations.

If radiological contamination becomes a concern, no equipment or materials will be released from the established radiological contaminated area until a comprehensive radiological survey has been completed (e.g., hand-held instruments, swipes), in accordance with MCP-425, "Surveys of Materials for Unrestricted Release and Control of Movement of Contaminated Material." Any contaminated and potentially contaminated PPE will be decontaminated (Section 10) or containerized and stored in the area of contamination until fully characterized. All items (including PPE, equipment, and debris) generated during any decontamination process shall be characterized as required to fulfill characterization and hazardous waste determination requirements in accordance with PRD-4001, "Waste Management."

7.4 Eating and Smoking

Ingestion of hazardous substances is possible when workers do not practice good personal hygiene habits. It is important to wash hands, face, and other exposed skin thoroughly after completion of work and before smoking, eating, drinking, and chewing gum or tobacco. CPP-629 is available for toilet and washroom facilities. **No smoking, chewing, eating, or drinking is allowed within the CERCLA construction area.** All BBWI smoking polices will be complied with, including disposing of smoking materials in the proper receptacle.

8. HAZARD ASSESSMENT

The overall objectives of this hazard assessment section are to provide guidance on the following:

- Evaluation of all construction tasks to determine the extent that potential radiological, chemical, and physical hazards may affect site personnel by all routes of entry
- Establishment of the necessary monitoring and sampling required to validate potential exposures, determine adequate action levels to mitigate potential exposures, and provide specific actions to be followed if action levels are reached
- Determination of engineering controls, isolation methods for construction tasks, work practices to limit personnel exposure, administrative controls, and appropriate respiratory protection and protective clothing to protect site personnel from construction and site hazards.

8.1 SSSTF Construction

Personnel will be exposed to safety hazards and potentially exposed to chemical, radiological, and physical agents while constructing the SSSTF at the ICDF Complex. The potential hazards to personnel entering the CERCLA construction area are dependent on the specific construction tasks and contaminants encountered and potential exposures from adjacent ICDF construction activities. Controls will be implemented (whenever possible), along with work practice controls (administrative), real-time monitoring of contaminants (as deemed appropriate), and site-specific hazard training to further mitigate potential hazards and exposures. Formal pre-planning (job walk-down, completion of the hazard profile screening checklist [HPSC], and pre-job briefing checklist), JSAs, and other construction work controls will be written based on the hazards identified in this HASP, the STD-101 work package, and site-specific conditions. Collectively, the documentation and training will be used to identify and mitigate hazards.

The SSSTF construction area will have a comprehensive ordnance survey completed prior to beginning construction activity. Discolored or stained soils identified during the ordnance investigation will be isolated and investigated prior to disturbance. Access to the SSSTF construction site requires ordnance awareness training for all individuals. The training provides information on necessary actions if ordnance or discolored soils are encountered (Table 4-1, "Required site-specific project training for SSSTF construction project").

Tables in this section identify the potential hazards that may be encountered during SSSTF construction, as well as monitoring methods, action limits, and other hazard-specific mitigation measures. These tables include

- Table 8-1 presents an evaluation of chemicals that will be used or may be encountered at the project site with respect to potential routes of exposure, symptoms of overexposure, and qualitative exposure risk potential based on the nature of the chemical, work tasks, and source term (concentration) present.
- Table 8-2 summarizes each primary construction task, associated hazards, and mitigation.
- Table 8-3 lists hazards (radiological and nonradiological) IH and RadCon personnel will monitor.
- Table 8-4 lists equipment available for monitoring these hazards.
- Table 8-5 presents action levels and associated responses for specific hazards.

Table 8-1. Evaluation of chemicals and potential agents that may be encountered at the SSSTF construction site.

Material or Chemical (CAS #, Vapor Density & Ionization Energy)[a]	Exposure Limit[b] (PEL/TLV)	Routes of Exposure[c]	Indicators or Symptoms of Over-Exposure[d] (Acute and Chronic)	Target Organs/System	Carcinogen? (source)[e]	Exposure Potential (all routes without regard to PPE)
Diesel fuel (8008-20-6)	TLV 100 mg/m^3 (ACGIH 2000, Notice of Intended Changes)	Ih, Ig, S, Con	Eyes irritation, respiratory system changes, dermatitis	Eye, respiratory system	No	Moderate Potential Will be used to refuel equipment.
Diesel exhaust (particulate aerodynamic diameter < 1 μm)	TLV-TWA: 0.05 mg/m^3 (ACGIH 2000, Notice of Intended Changes)	Ih,	Respiratory irritation, nose, throat or lungs, with stinging and redness of the eyes, headache, nausea, dizziness, unconsciousness	Respiratory system	A2 - ACGIH	Moderate Potential Numerous exhaust sources at the project site.
Bentonite (1302-78-9) VP: NA	TLV-TWA: 10 mg/m^3 (inhalable) 3 mg/m^3 (respirable)	Ih, Con, Ig	Skin, lung granulomas, retention in lungs, skin irritation and irritation of the mucous membranes	Skin, respiratory system	No	Low-Moderate Potential Bentonite will be mixed with soil.
Silica, respirable dust (14808-60-7) (partial fraction from bentonite and naturally occurring in soil)	TLV—Consult IH for silica type and TLV	Ih, Con	Pulmonary fibrosis, silicosis	Respiratory, eyes	Yes—NIOSH (potential)	Low–Moderate Potential Used to preserve QA/QC rinsate samples for metals analysis.
Radionuclides detected— none. Potential to encounter windblown radiological contamination only.						
Radionuclides (whole body exposure)	INEEL—700 mrem/yr, project ALARA dose, limit-per RWP Posting of radiation areas per INEEL RCM, Table 2-3	Whole body	If required, alarming electronic dosimetry will be used to alert workers to increased gamma radiation fields. TLDs for whole body TEDE	Blood-forming cells, GI tract, and rapidly dividing cells	Yes	Low Potential Area is not posted as a radiation area. Only potential for exposure from contamination that may be encountered but is considered minimal.

Table 8-1. (continued).

Material or Chemical (CAS #, Vapor Density & Ionization Energy)[a]	Exposure Limit[b] (PEL/TLV)	Routes of Exposure[c]	Indicators or Symptoms of Over-Exposure[d] (Acute and Chronic)	Target Organs/System	Carcinogen? (source)[e]	Exposure Potential (all routes without regard to PPE)
Radionuclides (fixed and removable surface contamination)	Surface contamination limits per INEEL RCM, Article 222 and Table 2-2, § 835.1102(b)	Ig, Con	Portable contamination instruments, swipes, and personal contamination monitor.	GI tract, ionization of internal tissue	Yes	Low Potential Area is not posted as a soil contamination area. Contact with potentially contaminated soil and surfaces.

a. MSDSs for these chemicals are available at the project site.

b. American Conference of Governmental Industrial Hygienists (ACGIH) 2000 TLV Booklet and OSHA, 29 CFR 1910, substance-specific standards.

c. (Ih) inhalation, (Ig) ingestion, (S) skin absorption, (Con) contact hazard.

d. (Nervous system) dizziness/nausea/lightheadedness; (dermis) rashes/itching/redness; (respiratory) respiratory effects; (eyes) tearing/irritation.

e. If yes, identify agency and appropriate designation (ACGIH A1 or A2, NIOSH, OSHA, IARC, NTP).

GI = gastrointestinal
RCM = *Radiological Control Manual*
TLD = thermoluminescent dosimeter
IARC = International Agency for Research on Cancer
TEDE = total effective dose equivalent
NTP = National Toxicology Program
TLV = threshold limit value

Table 8-2. SSSTF construction tasks, associated hazards, and mitigation.

Task(s)	Potential Hazard or Hazardous Agent	Hazard Elimination, Isolation, or Mitigation
• Preconstruction activities • Site preparation and mobilization tasks • Constructing roads • Constructing decon facility • Installation of equipment in decon facility • Installation of piping to intersect ICDF evaporation pond interface line • Construction and installation of truck weigh scale • Construction / mobilization of administration building • Utility installation including electrical, communications, utility conduit and system tie-ins • Paving / fencing • Sampling soil (if required)	1. Radiation exposure/dose—potential for encountering contaminated soil/equipment surfaces 2. Radiological contamination— potential for encountering contaminated soil/equipment surfaces 3. Nonradiological contaminants—fuel, bentonite mixing, thermal sealing liner, and dust 4. Pinch points/caught-between/struck-by—heavy equipment operations, vehicle/equipment movement, material handling tasks 5. Lifting/back strain—moving liner material, piping, bentonite 6. Heat/cold stress—outdoor work, summer/fall temperatures, potential PPE usage combined with strenuous workload 7. Hazards noise levels—heavy equipment and hand tools 8. Stored Energy—electrical, mechanical, thermal, elevated materials 9. Excavation/Soil movement—open excavation, heavy equipment movement, dust, uneven/unstable slopes, limited or obscured visual sight line for operators/workers 10. Crane/Overhead work – Moving material, suspended loads, hoisting and rigging, struck by/caught between	1. Controlled work areas, RWP, RCT surveys with direct reading instruments, alarming electronic dosimetry, postings, and training (as required) 2. Controlled work areas, RWP, RCT surveys with direct reading instruments, swipes, postings, training, personal contamination monitor (PCM), and PPE (as required) 3. Controlled work areas, MSDSs for all chemicals used, controlled work areas, controls for dust suppression, IH monitoring with direct-reading instruments, postings, and PPE (as required) 4. Qualified equipment operators, high-visibility vests, backup alarms, controlled work areas, SWP, body position awareness, and hand and head/face protection 5. Mechanical lifting/movement, proper lifting techniques, two-person lift (as required), pre-staging material near installation/mixing area 6. IH monitoring, work-rest or warm-up cycles (as required), stay times on SWP (as required) proper selection of work clothing/PPE, fluids available in eating/drinking area, personnel training 7. IH sound level monitoring and/or dosimetry, source identification, and hearing protection devices (as required) 8. Controlled work area, piping labeling, training, isolation of energy source lockout/tag out for all tie-in activities 9. Maintain minimum of 1.5:1 slope, designated and well-developed access ramps/travel lanes for equipment 10. Stay clear of suspended loads, control load swing with use of tag lines and approved hoisting/rigging methods, maintain clearance between crane swing radius to avoid serious injury

Table 8-3. SSSTF construction radiological and nonradiological hazards to be monitored.

Tasks	Radiological and Nonradiological Hazards to be Monitored[a]
• Preconstruction activities • Site preparation and mobilization tasks • Constructing roads • Constructing decon facility • Installation of equipment in decon facility • Installation of piping to intersect ICDF evaporation pond interface line • Construction and installation of truck weigh scale • Construction / mobilization of administration building • Utility installation including electrical, communications, utility conduit and system tie-ins • Paving / fencing • Sampling soil (if required)	**Radionuclide contamination** (alpha, beta, gamma)—Potential for windblown contamination from INTEC in the ECA. RadCon personnel will monitor during initial excavation tasks and as deemed appropriate. **Hazards noise**—heavy equipment, truck, and hand tools. **Silica/bentonite (dust)**[b]—During bentonite-soil mixing operations as deemed appropriate by project IH. **Particulates not otherwise classified (PNOC)**[b]—All soil disturbance tasks have potential to generate dust. Sampling to be conducted as deemed appropriate by project IH based on site-specific conditions and proximity of personnel to dust-generating task(s) for total and respirable fractions.

a. Monitoring and sampling will be conducted as deemed appropriate by project IH and RadCon personnel based on specific tasks and site conditions.

b. Sampling media, methods, and use of cyclone or other particle aerodynamic sizing devices will be based on site-specific conditions and as deemed appropriate by the project IH.

Table 8-4. Equipment available for monitoring radiological and non-radiological hazards.[a]

Chemical or Radiological Hazard to be Monitored or Sampled	Equipment and Monitoring/Sampling Methods[b]	
Particulates not otherwise classified (PNOC) and silica dust	Personal sampling pumps with appropriate media for all partial and full period sampling	PNOC (total and respirable)—NIOSH 0600 Silica—NIOSH 7500, 7501,7601, 7602 (as specified by IH)
Radionuclide contamination (alpha)	Count-rate—Bicron/NE Electra (DP-6 or AP-5 probe) or equivalent Stationary—Eberline RM-25 (HP-380AB or HP-380A probe) or equivalent CAM—ALPHA 6-A-1 (in-line and radial sample heads, pump, RS-485) or equivalent (as required) Grab Sampler—SAIC H-810 or equivalent	
Radionuclide contamination (beta/gamma)	Count-rate—Bicron NE/Electra (DP-6, BP-17 probes) or equivalent Stationary—Eberline RM-25 (HP-360AB probe) or equivalent CAM (beta)—AMS-4 (in-line and radial head, pump RS-485) or equivalent (as required) Grab Sampler—SAIC H-810 or equivalent	
Radionuclide contamination (general counting)	LB-5100/NFS-RPS Counting System or equivalent Alpha/Beta Scalars Protean or equivalent	
Personal contamination monitors	Eberline PCM-2 or PCM-1C or equivalent	
Radiation (gamma) fields and Geiger-Mueller (GM) instruments	Ion chamber—Eberline RO-20,RO-7 (2, 200 and 20K probes) or equivalent GM dose rate—Ludlum 2241 (HP-270 probe) or equivalent Electronic dosimetry—SAIC PD-3I with reader and RCMIS station or equivalent	
Hazardous noise levels (>85 dBA for an 8 hour workday, 83 dBA for a 10 hour day, >140 impact)	ANSI Type S2A sound level meter and/or ANSI S1.25-1991 dosimeter (A-weighted scale for TWA dosimetry, C-weighted for impact dominant sound environments)	
Heat/cold stress	Heat stress—WBGT, body weight, fluid intake	Cold stress—ambient air temperature, wind chill charts

a. Air sampling will be conducted as deemed appropriate by project IH and RadCon personnel based on initial direct-reading instrument data, swipes, and other site-specific factors.

b. Equivalent validated air sampling method may be selected if more appropriate for site-specific conditions.

ANSI = American National Standards Institute dBA = decibel A-weighted
PCM = personal contamination monitor TWA = time-weighted average
WGBT = wet bulb globe temperature

Table 8-5. Action levels and associated responses for SSSTF construction hazards.

Contaminant/Agent Monitored	Action Level	Response Taken if Action Levels Exceeded
Nuisance particulates (NOC)	>10 mg/m^3 (inhalable fraction) >3 mg/m^3 (respirable fraction)	1) Move personnel to upwind position of source, close equipment cab windows/doors. 2) Use wetting/misting methods to minimize dust and particulate matter. 3) IF wetting/misting methods prove ineffective, THEN don respiratory protection[a] (as directed by IH).
Silica (respirable fraction)	>0.05 mg/m^3	1) Move personnel to upwind position of source. 2) Use wetting/misting methods to minimize dust and particulate matter during mixing. 3) IF wetting/misting methods prove ineffective, THEN don respiratory protection[a] (as directed by IH).
Hazardous noise levels	<85 dBA 8-hr TWA, <83dBA 10-hr TWA	No action.
	85–114 dBA	Hearing protection required to attenuate to below 85 dBA 8 hr TWA or 83 dBA for 10-hr TWA (based device NRR).
	(a) >115 dBA (b) >140 dBA	(a) Isolate source, evaluate NRR for single device, double protection as needed. (b) Control entry, isolate source, only approved double protection worn.
Radiation field	<5 mrem/hr	No action, no posting required.
	5–100 mrem/hr @ 30 cm (§835.603.b)	Post as "Radiation Area"—Required items: RW I or II training, RWP, personal dosimetry.
	>100 mrem–500 Rad @ 100 cm (§835.603.b)	Post as "High Radiation Area"—Required items: RW II, RWP, alarming personal dosimetry, dose rate meter, and temporary shielding (as required). ALARA review required.
Radionuclide contamination	1-100 times RCM Table 2-2 values (§835.603.d)	Post as "Contamination Area"—Required items: RW II training, personal dosimetry, RWP, don PPE, bioassay submittal (as required).

Table 8-5. (continued).

Contaminant/Agent Monitored	Action Level	Response Taken if Action Levels Exceeded
	>100 times RCM Table 2-2 values (§835.603.d)	Post as "High Contamination Area"—Required items: RW II training, personal dosimetry, RWP (with pre-job briefing), don PPE, bioassay submittal (as required). ALARA review required.
Airborne radioactivity	Concentrations (μCi/cc) >30% of the DAC value (§835.603.d)	Post as "Airborne Radioactivity Area"—Required items: RW II training, personal dosimetry, RWP (with pre-job briefing), don PPE, bioassay submittal (as required).

a. Level C respiratory protection will consist of a full-face respirator equipped with a high-efficiency particulate air (HEPA) cartridge as prescribed by the project IH and RadCon personnel (based on contaminant of concern). See Section 9, Personal Protective Equipment, for additional Level C requirements.

CAM = continuous air monitor
DAC = derived air concentration
dBA = decibel A-weighted
eV = electron volt
NRR = noise reduction rating
RW = radiological worker
RCM = *Radiological Control Manual*
TWA = time-weighted average

A construction SWP, JSAs, and potentially a RWP may be needed in conjunction with this HASP to address hazardous and radiological conditions at the site. These work control documents will augment this HASP as part of the STD-101 work package to provide further details about specialized protective equipment and dosimetry requirements during construction and soil sampling tasks.

8.2 Routes of Exposure

Exposure pathways for contaminants encountered during construction tasks are directly related to the nature of tasks, type of equipment used, and effectiveness of project controls (e.g., engineering controls, contact avoidance). Engineering work controls, isolation methods, and training are all intended to mitigate potential exposures and uptake of contaminants. However, the potential for exposure to contaminants or chemicals by project personnel still exists.

Exposure pathways include

- Inhalation of contaminated soil (if encountered) or fugitive dusts. Inhalable or respirable (dependent on the particle aerodynamic diameter) fugitive dusts may have trace amounts of contaminants or radionuclides associated with them resulting in potential respiratory tract deposition.

- Skin absorption and contact with contaminated surfaces during soil sampling (if conducted) tasks that can be absorbed through broken skin, resulting in potential absorption through the skin and/or skin contamination.

- Ingestion of potentially contaminated soil or materials adsorbed to dust particles or on surfaces resulting in potential uptake of contaminants through the gastrointestinal (GI) tract that may result in GI irritation, internal tissue irradiation, and/or deposition to target organs.

- Injection of contaminated materials by breaking of the skin or migration through an existing wound, resulting in localized irritation, contamination, uptake of soluble contaminants, and deposition of insoluble contaminants.

8.3 Environmental and Personnel Monitoring

RadCon and IH personnel will conduct initial and periodic monitoring with direct reading instrumentation, collect swipes, and conduct full and partial period air sampling, as deemed appropriate, in accordance with the applicable MCPs and other guidelines. Instrumentation listed on Table 8-3 will be selected based on the site-specific conditions and contaminants associated with construction tasks. The RCT and IH will be responsible for determining the best monitoring technique for radiological and nonradiological contaminants (respectively).

Specific hazardous agent exposures that will be monitored are listed on Table 8-3. The IH and radiological monitoring are outlined in Sections 8.3.1 and 8.3.2, respectively. Safety hazards and other physical hazards will be monitored and controlled as outlined in Section 8.4.

8.3.1 Industrial Hygiene Monitoring

Various direct-reading instruments may be utilized to determine the presence of nonradiological and other physical agents. The frequency and type of sampling and monitoring will be determined by changing site conditions, direct-reading instrument results, observation, and professional judgment.

Instruments and sampling methods listed in Table 8-3 are available for use by the project IH as deemed appropriate.

Full- and partial-period airborne contaminant sampling may be conducted as deemed appropriate by the project IH based on direct-reading instrument readings and changing site conditions. If conducted, all air sampling will be done using applicable NIOSH or OSHA methods and in conformance with the INEEL safety and health manuals (Safety and Health Department 2002a,b). Risk assessments for site personnel will be conducted according to the INEEL safety and health manuals (Safety and Health Department 2002a,b)and MCP-153, "Industrial Hygiene Exposure Assessment."

8.3.1.1 Industrial Hygiene Instrument and Equipment Calibration. All monitoring instruments will be maintained and calibrated in accordance with the manufacturer's recommendations, existing IH protocol, and in conformance with the BBWI safety and health manuals (Safety and Health Department 2002a,b). Direct reading instruments will be calibrated, at a minimum, prior to daily use and more frequently as determined by the project IH. Calibration information, sampling and monitoring data, results from direct-reading instruments, and field observations will be recorded per Section 3 of this HASP.

8.3.2 Radiological Monitoring

The SSSTF construction area is not currently posted as a radiologically controlled area and the only potential source for contamination to be encountered is from windblown surface contamination (from INTEC) that may be in the ECA. RadCon surveys will be conducted during initial excavation activities and as deemed appropriate by RadCon personnel to confirm radiological contamination is not present. Instruments and sampling methods listed in Table 8-4 may be used by the project RCT as deemed appropriate. When conducted, monitoring will be performed in accordance with *INEEL Radiological Control Manual* (Radiological Control Department 2000); MCP-139, "Radiological Surveys"; MCP-425, "Surveys of Materials for Unrestricted Release and Control of Movement of Contaminated Material"; and MCP-357, "Job-Specific Air Sampling/Monitoring."

8.3.2.1 Radiological Instrument and Equipment Calibration. RadCon personnel may utilize any of the radiation and contamination detectors and counters listed in Table 8-5 to provide radiological information to project personnel. When used, daily operational and source checks will be performed on all portable survey instruments to ensure they are within the specified baseline calibration limits. Accountable radioactive sources will be maintained in accordance with MCP-137, "Radioactive Source Accountability and Control." All radiological survey and monitoring equipment will be maintained and calibrated (a) in accordance with the manufacturer's recommendations and existing RadCon protocol and (b) in conformance with the *INEEL Radiological Control Manual* (Radiological Control Department 2000); MCP-93, "Health Physics Instrumentation"; and 10 CFR 835.401(b).

8.3.2.2 External Dosimetry. Dosimetry for personnel conducting construction tasks will be specified by project RadCon personnel and in the task-specific RWP (if required). All project personnel will wear personal dosimetry devices in accordance with the *INEEL Radiological Control Manual* (Radiological Control Department 2000) and as directed by RadCon personnel.

If a RWP is required, RCIMS will be utilized. Individuals are responsible for logging into RCIMS when electronic dosimeters are required.

8.3.2.3 Internal Monitoring. Internal monitoring is not anticipated for this construction project. If contamination is encountered, internal dosimetry (whole body counts and bioassay) will be specified by the project RE and on the RWP.

8.3.3 Exposure Action Limits

Action levels have been established for hazards and contaminants that may be encountered during SSSTF construction tasks to prevent and mitigate potential personnel exposure to radiological, nonradiological, and physical hazards. The project IH and RCT will evaluate investigation and sampling tasks using real-time monitoring as described in Section 8.3 based on the site-specific conditions and as deemed appropriate.

Specific action levels will only apply if the hazard or contaminant listed on Table 8-5 is encountered. If action levels are reached, personnel will take the appropriate actions as listed. For PPE upgrades, the threshold for the particular level of PPE currently being worn must be exceeded or another type of contaminant introduced that will require modifications (i.e., Level C full-face ensemble offers a respiratory protection factor of 100 [nonradiological contaminants], so no further upgrade would be required if airborne contaminants were detected unless the protection factor is exceeded). For sustained airborne contaminants, full- or partial-period air samples will be collected to quantify the contaminant of concern.

8.4 Physical Hazards Evaluation, Control, and Monitoring

Physical hazards anticipated or that may be encountered during SSSTF construction tasks and methods that will be used to monitor and control them are described in this section. It is critical that all personnel are aware and understand the nature of the construction tasks that will be conducted, the equipment to be used, and the controls in place to eliminate or mitigate potential safety hazards.

8.4.1 Temperature Extremes

Given the duration of the SSSTF construction, there is a potential that both heat and cold stress factors could affect construction personnel based on ambient air temperatures and layered PPE (if required).

8.4.1.1 Heat Stress. For the construction tasks, temperatures will be variable and personnel may be required to wear protective clothing that prevents the body from cooling. High ambient air temperatures can result in increased body temperature, heat fatigue, heat exhaustion, or heat stroke that can lead to symptoms ranging from physical discomfort, unconsciousness, and death. Personnel must inform the FCC or HSO when experiencing any signs and/or symptoms of heat stress or observing a fellow employee ("buddy") experiencing them. PRD-2107, "Heat and Cold Stress," and Table 8-6 of this section describe heat stress hazards further. Heat stress stay times will be documented on the SWP by the IH when personnel are required to wear PPE that may increase heat body burden. These stay times will take into account the nature of the work (i.e., light, moderate, heavy), type of PPE worn, and ambient work temperatures.

Individuals showing any of the symptoms of heat exhaustion listed in Table 8-6 shall

- Stop work
- Exit or be helped from the work area
- Remove/decontaminate protective clothing (as applicable)
- Move to sheltered area to rest.

Table 8-6. Heat stress signs and symptoms.

Heat-Related Illness	Signs and Symptoms	Emergency Care
Heat rash	Red skin rash and reduced sweating	Keep the skin clean; change all clothing daily; cover affected areas with powder containing cornstarch or with plain cornstarch.
Heat cramps	Severe muscle cramps, exhaustion, sometimes with dizziness or periods of faintness	Move the patient to a nearby cool place; give the patient half-strength electrolytic fluids; if cramps persist, or if more serious signs develop, seek medical attention.
Heat exhaustion	Rapid, shallow breathing; weak pulse; cold, clammy skin; heavy perspiration; total body weakness; dizziness that sometimes leads to unconsciousness	Move the patient to a nearby cool place; keep the patient at rest; give the patient half-strength electrolytic fluids; treat for shock; seek medical attention. DO NOT TRY TO ADMINISTER FLUIDS TO AN UNCONSCIOUS PATIENT.
Heat stroke	Deep, then shallow, breathing; rapid, strong pulse, then rapid, weak pulse; dry, hot skin; dilated pupils; loss of consciousness (possible coma); seizures or muscular twitching	Cool the patient rapidly. Treat for shock. If cold-packs or ice bags are available, wrap them and place one bag or pack under each armpit, behind each knee, one in the groin, one on each wrist and ankle, and one on each side of the neck. Seek medical attention as rapidly as possible. Monitor the patient's vital signs constantly. DO NOT ADMINISTER FLUIDS OF ANY KIND.

Note: Heat exhaustion and heat stroke are extremely serious conditions that can result in death and should be treated as such. Transport individual immediately to the CFA-1612 medical facility.

- Be provided cool drinking water
- Be monitored by a medic or CPR/first-aid-certified employee.

Monitoring for heat stress conditions shall be performed according to the PRD-2107, "Heat and Cold Stress." Depending on the ambient weather conditions, work conditions, type of PPE worn (if required), and the physical response of work operations personnel, the IH shall inform the FCC/RCT of necessary adjustments to the work/rest cycle. Additionally, physiological monitoring may be conducted to determine if personnel are replenishing liquids fast enough. A supply of cool drinking water should be provided in designated eating areas and consumed only in these areas. Workers may periodically be interviewed by the IH/RCT or HSO to ensure that the controls are effective and that excessive heat exposure is not occurring. Workers will be encouraged to monitor their body signs and to take breaks if symptoms of heat stress occur.

8.4.1.2 *Low Temperatures.* Exposure to low temperatures will only be a factor if project tasks are conducted in the fall or winter months or if relatively cool ambient temperatures and wet or windy conditions increase the potential for cold injury to personnel. The project IH and HSO will be responsible for obtaining meteorological information to determine if additional cold stress administrative controls are required. PRD-2107, "Heat and Cold Stress," discusses the hazards and monitoring of cold stress. Table 8-7 provides the cold stress work/warm-up schedule if cold stress conditions exist (late fall, winter,

Table 8-7. Cold stress work/warm-up schedule (for winter season).

Air Temp (°F) (approx.)	No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
	Max Work Period	No. of Breaks	Max Work Period	No. of Breaks	Max Work Period	No. of Breaks	Max Work Period	No. of Breaks	Max Work Period	No. of Breaks
-15° to -19°	Normal breaks	1	Normal breaks	1	75 min	2	55 min	3	40 min	4
-20° to -24°	Normal breaks	1	75 min	2	55 min	3	40 min	4	30 min	5
-25° to -29°	75 min	2	55 min	3	40 min	4	30 min	5	Nonemergency work should cease	
-30° to -34°	55 min	3	40 min	4	30 min	5	Nonemergency work should cease			
-35° to -39°	40 min	4	30 min	5	Nonemergency work should cease					
-40° to -44°	30 min	5	Nonemergency work should cease							
-45° and below	Nonemergency work should cease									

early spring). Project personnel will also be cautioned regarding cold stress factors associated with rapid cooling once impermeable PPE layers are removed causing the potential for freezing of accumulated moisture on PPE outer and inner surfaces (under extremely cold conditions). The requirements listed in Section 9, Table 9-1, will be followed for the outer layer of protection based on radiological and nonradiological hazards.

Additional cold weather hazards may exist from working on snow- or ice-covered surfaces. Slip, fall, and material handling hazards are increased under these conditions. Every effort must be made to ensure walking surfaces are kept clear of ice. The FCC or HSO should be notified immediately if slip or fall hazards are noted at the project site.

8.4.2 Noise

Personnel involved in construction activities may be exposed to noise levels from the heavy equipment, trucks, hand tools, and compressors that may exceed 85 decibel A-weighted (dBA) for an 8-hr time-weighted average (TWA). The effects of high sound levels (noise) may include the following:

- Personnel being startled, distracted, or fatigued
- Physical damage to the ear, pain, and temporary or permanent hearing loss
- Interference with communication that would warn of danger.

Noise measurements (using instruments listed on Table 8-5) will be performed by the IH as deemed appropriate per the PRD-2108, "Hearing Conservation Program," to determine if personnel assigned to the jobs identified are above allowable noise exposure levels. A TLV of 85 dBA TWA will be applied to personnel exposed to noise levels over no more than an 8-hr day. This level is based on a 16-hr "recovery" period in a low noise environment. If personnel are required to work longer than 8 hr in a hazardous noise environment, then the TLV will be adjusted to a lower value. The project IH must be consulted regarding modifications to the 85 dBA for an 8-hr TLV and 83 dBA for a 10-hr TWA value.

Personnel whose noise exposure routinely meets or exceeds the allowable level will be enrolled in the INEEL OMP or appropriate subcontractor hearing conservation program. Personnel working on jobs that have noise exposures greater than 85 dBA (83 dBA for a 10-hr TWA) will be required to wear hearing protection until noise levels have been evaluated and will continue to wear the hearing protection specified by the IH until directed otherwise.

8.4.3 Fire and Flammable Materials Hazards

Flammable and combustible material hazards may include combustible materials near ignition sources (hot motor or exhaust system) and transfer and storage of flammable or combustible liquids in the construction area (if a generator is used). Portable fire extinguishers with a minimum rating of 10A/60BC shall be strategically located at the site to combat Class ABC fires. They will be located in the construction area, on or near all site equipment that has exhaust heat sources, and on or near all equipment that is capable of generating ignition or has the potential to spark.

8.4.3.1 Combustible Materials. Combustible or ignitable materials in contact with or near exhaust manifolds, catalytic converters, or other ignition sources could result in a fire. The project fire protection engineer should be contacted if questions arise regarding potential ignition sources. The accumulation of combustible materials will be strictly controlled at the project site. Disposal of combustible materials shall be assessed at the end of each shift. Class A combustibles such as trash, cardboard, rags, wood, and plastic will be properly disposed of in metal receptacles.

8.4.3.2 Flammable and Combustible Liquids. Diesel fuel that may be used at the task site for fueling must be safely stored, handled, and used. Only FM/UL-approved flammable liquid containers, labeled with the content, will be used to store fuel. All fuel containers will be stored at least 15 m (50 ft) from any facilities and ignition sources or stored inside an approved flammable storage cabinet. Additional requirements are provided in PRD-2201, "Flammable/Combustible Liquid Storage." Portable motorized equipment (generators, light plants, etc.), will be shut off and allowed to cool down in accordance with the manufacturer's operating instructions prior to refueling to minimize the potential for a fuel fire.

8.4.4 Biological Hazards

The SSSTF construction area is an area with a potential for encountering nesting materials or other biological hazards/vectors. Staged construction materials and equipment may provide habitat for various rodents and/or snakes. Based on biological studies done at the INEEL, deer mice have been known to carry the Hantavirus. The Hantavirus may be present in the nesting and fecal matter of deer mice. A potential exists for project personnel to disturb nesting or fecal matter during the course of construction activities. If such materials are disturbed, they can become airborne and create a potential inhalation pathway for the virus. Contact and improper removal of these materials may provide additional inhalation exposure risks.

If suspected rodent nesting or excrement material is encountered, the project IH will be notified immediately and **no attempt shall be made to remove or clean the area**. Following an evaluation of the area, disinfection and removal of such material from the project task area will be conducted in accordance with MCP-2750, "Preventing Hantavirus Infection."

8.4.5 Confined Spaces

Construction tasks are not anticipated to create confined spaces during excavation activities. If utility tie-ins will require entry into a posted confined space then all requirements of PRD-2110, "Confined Spaces," will be followed. If there is any question as to where a space may meet the definition of a confined space, then contact the project IH prior to entry.

8.4.6 Safety Hazards

Industrial safety hazards pose a significant, if not the most likely, threat to personnel performing construction tasks. Section 6 provided general safe-work practices that must be followed at all times. The following sections describe specific industrial safety hazards and procedures to be followed to eliminate or minimize potential hazards to project personnel.

8.4.6.1 Handling Heavy Objects. Handling liner sections, bags of bentonite, piping or conduit sections, and various other pieces of equipment may result in employee injury. Manual material handling will be minimized through task design and use of mechanical and/or hydraulic lifts whenever possible. All lifting and material handling tasks will be performed in accordance with PRD-2016, "Material Handling, Storage, and Disposal." Additionally, back strain and ergonomic considerations must be given to material handling and equipment usage. Mechanical lifting devices should be used to move materials whenever possible.

8.4.6.2 Powered Equipment and Tools. All power equipment and tools will be properly maintained and used according to the manufacturer's specifications by qualified individuals. PRD-2015, "Hand and Portable Power Tools," will be followed for all work performed with powered equipment including hand tools.

8.4.6.3 Heavy Equipment and Moving Machinery. The hazards associated with the operation of heavy equipment, such as backhoes/trackhoes, loaders, scrapers, and industrial trucks, include injury to personnel (struck-by/caught-between), equipment damage, and/or property damage. All heavy equipment will be operated in the manner in which it was intended and according to manufacturer's instructions. Only authorized personnel will be allowed in the vicinity of operating heavy equipment and must maintain visual communication with the operator. Construction personnel shall comply with PRD-2020, "Heavy Industrial Vehicles"; PRD-2019, "Motor Vehicle Safety"; and DOE-STD-1090-2001, Chapter 10.

Site personnel working around or near heavy equipment and other moving machinery shall also comply with PRD-160/PRD-2007, "Hoisting and Rigging," and/or DOE-STD-1090-96, "Hoisting and Rigging," as applicable and appropriate. Additional safe practices will include

- All heavy equipment will have backup alarms.
- Walking directly in back of or to the side of heavy equipment without the operator's knowledge will be prohibited. All precautions will be taken prior to moving heavy equipment.
- While operating heavy equipment in the work area, the equipment operator shall maintain communication with a designated person responsible for providing direct voice contact or approved standard hand signals. In addition, all site personnel in the immediate work area shall be made aware of the equipment operations.

- Traffic lanes shall be established for transport of excavated material from the SSSTF excavation areas to the stockpile area (as required). These lanes are not to be used by other vehicles and should be kept clear of equipment or materials. These lanes shall include turn-around areas.

- All equipment shall be kept out of traffic lanes and access ways and shall be stored so as not to endanger personnel at any time.

8.4.6.4 Electrical Hazards/Energized Systems. Tie-ins will be required to be made for the SSSTF leachate collection system, crest pad building(s), and other support systems. Electrical equipment and tools may pose shock or electrocution hazards to personnel. Safety-related work practices shall be employed to prevent electric shock or other injuries resulting from direct or indirect electrical contact. Work on energized systems will conform to the requirements in the PRD-2011, "Electrical Safety," and PRD-2012, "Lockout and Tagout," including any applicable facility supplemental lockout and tagout procedures, and Parts I through III of the National Fire Protection Act (NFPA) 70E. In addition, all electrical work will be reviewed and completed under the appropriate work controls (i.e., SWPs, work orders).

8.4.6.5 Personal Protective Equipment. Wearing PPE may reduce a worker's ability to move freely, see clearly, and hear directions and noise that might indicate a hazard. PPE can also increase the risk of heat stress. Work activities at the task site will be modified as necessary to ensure that personnel are able to work safely in the required PPE. Work-site personnel shall comply with PRD-2001, "Personal Protective Equipment," and MCP-432, "Radiological Personal Protective Equipment." The PPE levels for each task are described in Section 9 and listed in Table 9-2 of that section.

8.4.6.6 Decontamination. Decontamination procedures for personnel and equipment are detailed in Section 10. These procedures will serve as the primary decontamination method for all personnel and equipment that enters the construction area or HAZWOPER zones and radiological controlled areas (if established). PRD-4001, "Waste Management," and appropriate BBWI MCPs provide additional requirements for chemical and radionuclide decontamination requirements.

If decontamination of equipment is required, construction personnel will follow instructions as directed by project RadCon and IH personnel, who will follow *Manual 14B - Safety and Health-Occupational Health* (Safety and Health Department 2002b), MCPs, and general IH practices.

8.4.6.7 Excavation, Surface Penetrations, and Outages. Construction of the SSSTF will require excavation activities. All surface penetrations and related outages will be coordinated through the FCC and will require submittal of an outage request (Form L-0433.1) for outages (road, electrical, water, etc.). The submission of an outage request shall not be considered an approval to start the work. Other specific outage requirements are addressed in the contract special conditions. Hydrants available for water and associated requirements are identified in the subcontract special conditions. No surface penetrations will be allowed until the area has been evaluated and an approved subsurface evaluation documented.

All excavation activities will be conducted and monitored in accordance with PRD-2014, "Excavation and Surface Penetrations," and 29 CFR 1926, Subpart P, "Excavations." The following are some key elements from these requirements:

- The location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.

- Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design and shall be constructed in accordance with the design. Structural ramps shall be inspected using Form 432.57.

- Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflector or high-visibility material.

- Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence.

- Sloping or benching shall be constructed and maintained in accordance with the requirements set forth in 29 CFR 1926, Subpart B, Appendix B, for the soil type as classified by the competent person. This classification of the soil deposits shall be made based on the results of at least one visual and at least one manual analysis.

8.4.7 Inclement Weather Conditions

When inclement or adverse weather conditions develop that may pose a threat to persons or property at the task site (such as sustained strong winds 25 mph or greater, electrical storms, heavy precipitation, or extreme heat or cold), these conditions will be evaluated and a decision made by the HSO with input from the IH, SE, RCT, and other personnel, as appropriate, to stop work, employ compensatory measures, or to proceed. The FCC and HSO shall comply with INEEL MCPs and site work control documents that specify limits for inclement weather.

During all site activities, the project HSO, in consultation with the FCC, RadCon and IH personnel, will determine if wind or other weather conditions pose unacceptable hazards to personnel or the environment.

Note: Wind restrictions governing hoisting and rigging activities are provided in PRD-2007, "Hoisting and Rigging."

8.5 Other Site Hazards

Task-site personnel should continually look for potential hazards and immediately inform the FCC or HSO of the hazards so that action can be taken to correct the condition. The HSO, RCT, and FCC will be at the project site and visually inspect the site to ensure that barriers and signs are being maintained, unsafe conditions are corrected, and debris is not accumulated on the site and will be stored and disposed of in accordance with the applicable contractual special conditions. The construction subcontractor laydown area will be identified in the special conditions. Construction materials may be stored near the construction site in accordance with PRD-5016, "Material and Equipment Storage, Handling, and Maintenance," and other PRD 5000 series requirements.

Periodic safety inspections will be performed by the SE, HSO, FCC, or construction subcontractor superintendent in accordance with PRD-1006, "Safety Surveillance," and MCP-3449, "Safety and Health Inspections." Additionally, targeted and/or required self-assessments may be performed during investigation and sampling operations in accordance with MCP-8, "Self-Assessments Process for

Continuous Improvement." All inspections and assessments will be documented and available for review by the FCC.

Health and safety professionals present at the task site may, at any time, recommend changes in work habits to the FCC or construction subcontractor. However, all changes that may affect the project written work control documents (e.g., HASP, JSAs, RWPs, SWPs, work order) must have concurrence from the appropriate project technical discipline representative onsite and a DAR prepared as required.

Personnel working at the task site are responsible to use safe work techniques, report unsafe working conditions, and exercise good personal hygiene and housekeeping habits throughout the course of their job. CPP-629 may serve as the toilet and washroom facility for SSSTF construction activities although portable toilets and washrooms are anticipated.

9. PERSONAL PROTECTIVE EQUIPMENT

The primary hazards associated with construction of the SSSTF are industrial safety in nature (excavation, heavy equipment operation, facility construction, utility placement and tie-ins, fencing and paving operations, scale placement and installation, and vehicle operation). Additional potential hazards exist from contact with contaminated soil if encountered. Anyone entering the construction area (and CRZ and EZ if contamination is encountered) must be protected against potential safety and exposure hazards. This section addresses PPE to be worn for construction and sampling tasks and contingencies for upgrading/downgrading PPE.

The purpose of PPE is to shield or isolate personnel from chemical, radiological, physical, and/or biological hazards that cannot be eliminated though engineering or other controls. It is important to realize that no one PPE ensemble can protect against all hazards under all conditions and that proper work practices and adequate training will serve to augment PPE to provide the greatest level of protection to workers.

Selection of the proper PPE to protect project site personnel is based on the following:

- Specific conditions and nature of the tasks (e.g., excavation, soil sampling, heavy equipment operation)
- Potential contaminant routes of entry
- Physical form and chemical characteristics of contaminants (if encountered)
- Acute and chronic effects from exposure to contaminants (if encountered)
- Local and systemic toxicity of contaminants (if encountered)
- Potential exposure levels (surface and airborne)
- The hazard assessment (Section 8) evaluation of this HASP.

If radiological contamination is encountered at levels requiring the use of anticontamination (Anti-C) clothing, these requirements will be stated in a task-specific RWP that will have been developed in conformance with *INEEL Radiological Control Manual* (Radiological Control Department 2000) and MCP-432, "Personal Protective Equipment."

PPE is generally divided into two broad categories: (1) respiratory protective equipment and (2) personal protective clothing. Both categories are incorporated into the traditionally recognized four levels of personal protection equipment (Levels A, B, C, and D). Table 9-1 provides guidance in the selection process for respiratory and protective clothing. Based on contaminants that may be encountered during construction activities, a combination of Level D and contingency for modified Level D PPE is anticipated. Respiratory protection may be required if contaminants or chemical/mineral compounds are detected above established action levels. Levels A and B PPE are not anticipated to be required for personnel conducting SSSTF construction tasks.

The SSSTF construction tasks site will be monitored by RadCon and IH personnel, as deemed appropriate, to evaluate changing conditions and to determine the most appropriate PPE level (including modifications). Task-based PPE (respiratory protection and protective clothing) required and potential upgrades are listed on Table 9-2.

Table 9-1. Respiratory and protective clothing selection guidance.

Hazard	Level of Protection
Respiratory PPE Selection [a]	
Not immediately dangerous to life or health (IDLH) or oxygen-deficient atmospheric conditions; gaseous, vapor, particulate and/or aerosol chemicals/radionuclides	Level C—full-facepiece, as determined by IH/RadCon Level B—full-facepiece supplied air respirator with an air-purifying escape cartridge or airhood (bubblehood) HEPA/chemical combination cartridge for concentrations up to the protection factor of an air-purifying full-facepiece respirator and within the assigned derived air concentrations (DAC) [b] value
IDLH or oxygen-deficient atmospheric conditions; gaseous, vapor, particulate and/or aerosol chemicals/radionuclides	Level B—full-facepiece, supplied air respirator with an escape-only SCBA [c] or Level A—SCBA HEPA/chemical combination cartridge for concentrations up to the protection factor of an air-purifying full-facepiece respirator and within the assigned DAC [b] value
Protective Clothing Selection	
Low atmospheric contaminant levels that are present under stable conditions. No anticipated immersion, splashes, or potential for unexpected contact with chemical or radiological contaminants.	Level D **This level of PPE is anticipated throughout project unless contamination encountered or work with chemicals having specified hazards.**
Moderate atmospheric contaminants under relatively stable conditions; liquid splashes or other direct contact that do not have corrosive characteristics or can be absorbed by exposed skin. Low radionuclide contamination and airborne radioactivity levels.[d]	Level C (contingency only)
Moderate to high atmospheric contaminants under unstable conditions; potential for contact with wet, contaminated surfaces/material that can saturate or permeate Level C protective clothing. Moderate radionuclide contamination and airborne radioactivity levels.[d]	Level B[d] (not anticipated to be worn)
High and unknown atmospheric contaminants; potential for contact with substances that pose a high hazard potential to the skin; high potential for splash, immersion, or exposure to unexpected vapors, gases, aerosols, or dusts that may present an IDLH situation/readily absorbed through the skin. High radionuclide contamination and airborne radioactivity levels.[d]	Level A[d] (will not be worn)

a. A HEPA or multichemical/HEPA combination cartridge to be selected by IH and RadCon personnel based on specific task hazards.

b. DAC based on specific radionuclides (if encountered).

c. SCBA = self-contained breathing apparatus.

d. Contamination levels and airborne radioactivity as defined by *INEEL Radiological Control Manual*, Table 2-4.

Table 9-2. SSSTF construction task-based PPE requirements and modifications.

Task	Level of PPE	Primary or Contingency	Modifications and Comments
Tasks with Low Potential for Airborne or Contact Hazards			
• Site preparation and mobilization tasks	Level D	Primary	Level D PPE as defined in Section 9.2.1. Modification for specific hand protection for personnel will be defined in the JSA and/or RWP (if required).
• Constructing roads	Level D	Primary	Level D PPE as defined in Section 9.2.1. Modification for specific hand protection for personnel will be defined in the JSA and/or RWP (if required).
• Constructing decon facility	Level D	Primary	Level D PPE as defined in Section 9.2.1. Modification for specific hand protection for personnel will be defined in the JSA and/or RWP (if required).
• Installation of equipment in decon facility	Level D	Primary	Level D PPE as defined in Section 9.2.1. Modification for specific hand protection for personnel will be defined in the JSA and/or RWP (if required).
• Installation of piping to intersect ICDF evaporation pond interface line	Modified Level D	Upgrade contingency	Upgrading to modified Level D (protective clothing, Tyvek coveralls or equivalent) may be required if contamination (radiological or nonradiological) is detected.
• Construction and installation of truck weigh scale	Modified Level D	Upgrade contingency	Upgrading to modified Level D (protective clothing, Tyvek coveralls or equivalent) may be required if contamination (radiological or nonradiological) is detected.
• Construction / mobilization of administration building	Modified Level D	Upgrade contingency	Upgrading to modified Level D (protective clothing, Tyvek coveralls or equivalent) may be required if contamination (radiological or nonradiological) is detected.
• Utility installation including electrical, communications, utility conduit and system tie-ins	Modified Level D	Upgrade contingency	Upgrading to modified Level D (protective clothing, Tyvek coveralls or equivalent) may be required if contamination (radiological or nonradiological) is detected.
• Paving / fencing	Modified Level D	Upgrade contingency	Upgrading to modified Level D (protective clothing, Tyvek coveralls or equivalent) may be required if contamination (radiological or nonradiological) is detected.
• Sampling soil (if required)	Level C	Upgrade contingency	If airborne contaminants increase to concentrations above established action limits (Table 8-5), Level C full-face air-purifying respiratory protection will be worn in conjunction with chemical protective clothing.

9.1 Respiratory Protection

IH and RadCon monitoring will focus on moderate-potential activities to verify airborne contaminants are below the action limits. Respiratory protection will be made available only as a contingency if action limits are exceeded or site conditions change such that additional respiratory protection is required (i.e., upgraded). If respiratory protection is required, assigned protection factors (APFs) for respiratory devices listed on Table 9-3 will not be exceeded.

All personnel required to wear respirators shall complete training and be fit-tested before being assigned a respirator per the training and documentation requirements in Section 4 of this HASP. Requirements for respirator use, emergency use, storage, cleaning, and maintenance, as stated in the PRD-2109, "Respiratory Protection," shall be followed.

9.2 Personal Protective Equipment Levels

The following sections provide detail and explanation of the two levels of PPE anticipated to be worn during construction activities (Level C is a contingency only). Modifications to these levels shall be made under the direction of the HSO in consultation with the project IH and RadCon personnel, as appropriate. Such modifications are routinely employed during HAZWOPER site activities to maximize efficiency and to meet site-specific needs without compromising personnel safety and health. Table 9-2 lists each task or assignment and the corresponding level of PPE, as well as any additional or special items necessary for personal protection at the task site. The HSO, IH, and RadCon personnel will determine what modifications are appropriate to the PPE levels listed on Table 9-2.

9.2.1 Level D Personal Protective Equipment

Level D or modified Level D will serve as the primary PPE level for SSSTF construction activities. Level D PPE will only be selected as a work uniform and not on a site with respiratory or skin absorption hazards requiring whole body protection. This level provides no protection against airborne chemical hazards, but rather is used for protection against nuisance contamination and physical hazards. Level D PPE will only be allowed in areas that have been characterized or are known to have never been contaminated.

Note: Personnel must inspect all PPE before donning and entry into any work zone. Items found to be defective or that become unserviceable during use will be doffed and disposed of in accordance with posted procedures and placed into the appropriate waste stream. The PPE inspection guidance is provided in Section 9.4.

Table 9-3. APFs for respiratory devices.[a]

Type of Respirator	Respiratory Inlet Covering (full facepiece)	
Full-face air-purifying with appropriate cartridge	Chemical agents 100[b]	Radionuclides 100[c,d]

a. ANSI Z88.2-1992.

b. MCP-2726, "Respiratory Protection."

c. Particulates only. When HEPA filters are used in atmospheres not containing radioactive gas.

d. MCP-432.

Level D or modified Level D PPE will be the primary level of protective clothing and equipment worn for most tasks. The Level D PPE ensemble may be modified by the IH and/or RCT to provide protection from skin or other physical hazards but will not include the addition of respiratory protection. Level D PPE is discussed below:

- Level D PPE consists of the following:
  - Coveralls or standard work clothes (as determined by the IH and/or RCT)
  - Hard hat
  - Eye protection, safety glasses with side shields as a minimum (see PRD-2001, "Personal Protective Equipment")
  - Hand protection for all material-handling tasks (leather or other material specified by the IH)
  - Safety footwear (sturdy leather above the ankle as a minimum and steel or protective toe and shank, as determined by the SE).
- Optional Level D modifications may consist of the following:
  - Chemical or radiological protective clothing (Tyvek, Saranex, etc.) as prescribed in site-specific RWP or SWP
  - Chemically resistant hand and foot protection (inner/outer gloves, boot liners, etc.)
  - Radiological modesty garments under outer protective clothing
  - Any specialized protective equipment (hearing protection, face shields, etc.).

9.2.2 Level C Personal Protective Equipment

Level C PPE shall be worn when the task site chemical and/or radiological contaminants have been well characterized, indicating that personnel are protected from airborne exposures by wearing air-purifying respirators (APRs) with the appropriate cartridges, no oxygen-deficient environments exist (<19.5% at sea level), and no conditions pose IDLH. Basic Level C PPE shall include the following:

- Level D ensemble with the following respiratory and whole body protection upgrades:
  - Full-facepiece APR equipped with a NIOSH-approved cartridge (IH to specify type of cartridge [organic vapor, HEPA, combination, etc.])
  - Chemical-resistant coveralls (Tyvek QC®, Tychem 7500®, Saranex-23-P™, etc.) as prescribed in site-specific RWP or SWP (IH to specify material)
  - Chemical-resistant outer shoe/boot cover (IH and/or RCT to specify material)
  - Inner chemical-resistant nitrile rubber gloves with cotton liners (as determined by the IH and/or RCT)
  - Outer chemical-resistant Viton or polyvinyl alcohol gloves (as determined by the IH).

- Optional Level C modifications may consist of the following:
  - Radiological modesty garments under outer protective clothing
  - Any specialized protective equipment (hearing protection, aprons, etc.).

9.3 Protective Clothing Upgrading and Downgrading

The construction project HSO, in consultation with the project IH and RadCon personnel (as appropriate), will be responsible for determining when to upgrade or downgrade PPE requirements. Upgrading or downgrading of PPE requirements based on current conditions is a normal occurrence. Action levels, listed in Section 8, Table 8-5, provide the basis for determining such decisions. If changing conditions are encountered, new work control documents (e.g., work order, SWPs, RWPs, JSAs) may need to be written or updated to reflect these changes. Additional reasons for upgrading or downgrading include the following:

- Upgrading criteria or conditions (work will halt immediately if an upgrade in PPE is required until the proper PPE is donned)
  - Unstable or unpredictable site radiological and/or nonradiological hazards
  - Contaminants that present difficulty in monitoring or detecting
  - Known or suspected presence of skin absorption hazards
  - Temporary loss or failure of any engineering controls
  - Identified source or potential source of respiratory hazard(s)
  - Change in work procedures that may result in an increased contact with contaminants or meeting any of the criteria listed above.
- Downgrading criteria
  - New information of monitoring data that shows the contaminant levels to be lower than established action limits
  - Implementation of new engineering or administrative controls that eliminate or significantly mitigate hazards
  - Elimination of potential skin absorption or contact hazards
  - Change in site conditions that results in removal of physical hazards or reduces/isolates them to a controlled area
  - Completion or change in tasks that results in the elimination of key hazards that require higher levels of PPE.

Note: The project HSO will consult with RadCon personnel to evaluate RWP requirements based on upgrading or downgrading of PPE.

9.4 Inspection of PPE

All PPE ensemble components must be inspected both prior to and when in use within project work zones. Once PPE is donned, self-inspection and the use of the buddy system will serve as the principal forms of inspection. If at any time PPE should become damaged or degradation/permeation is suspected, an individual will inform others of the problem and proceed directly to the work zone exit point to doff and replace the unserviceable equipment. Additionally, all PPE that becomes grossly contaminated or presents a potential source for the spread of such contamination will be decontaminated or replaced. Table 9-4 provides an inspection checklist for common PPE items.

Table 9-4. PPE inspection checklist.

PPE Item	Inspection
Gloves	Before use:
	Pressurize gloves to check for pinholes: blow in the glove, then roll until air is trapped and inspect. No air should escape. Visible inspection of leather gloves for integrity should be conducted.
	While wearing in the work zone:
	Inspect for tears, punctures, and damage. Check all taped areas to ensure gloves are still intact.
Respirators (full-facepiece air-purifying)	Before use:
	Check condition of the facepiece, head straps, valves, connecting lines, fittings, all connections for tightness.
	Check cartridge to ensure proper type/combination for atmospheric hazards to be encountered, inspect threads and O-rings for pliability, deterioration, and distortion.
	While wearing in the work zone:
	Check to ensure no leakage can be detected and straps are secure. If breathing resistance or chemical break-through is experienced, exit the area following posted doffing instructions and report problem to IH.
Modified Levels D and C protective clothing	Before use:
	Visually inspect for imperfect seams, non-uniform coatings, tears, etc. Hold PPE up to the light and inspect for pinholes, deterioration, stiffness, and cracks.
	While wearing in the work zone:
	Evidence of chemical attack, such as discoloration, swelling, softening, and material degradation. Inspect for tears, punctures, and zipper or seam damage. Check all taped areas to ensure they are still intact.

10. DECONTAMINATION PROCEDURES

Because SSSTF construction activities will take place in an area not posted as a radiologically controlled area or chemical release area, decontamination requirements are not anticipated. If contamination is encountered, every effort will be made to prevent contamination of personnel and equipment. This will be accomplished through the use of engineering controls, isolation of source materials, site monitoring and surveying, personnel contamination control training, and following all contaminated material handling requirements and procedures.

10.1 Contamination Control and Prevention

If contamination is encountered, the use of engineering controls, protective barriers, protective clothing, modified work control practices, or addition of hold points and surveys will all be used to minimize direct contact with contaminated surfaces. The following contamination control and prevention measures will be employed if contamination is encountered:

- Identifying sources of contamination and design confinement, isolation, and engineering controls (where feasible) to eliminate or mitigate any potential for contact or release of contaminants
- Limiting the number of personnel, equipment, and materials that enter the contaminated area
- Conducting periodic surveys/monitoring and collecting smears (as deemed appropriate) during investigation activities. If contamination is found on the outer surfaces of equipment, decontamination procedures will be implemented to prevent the spread of contamination (see Section 10.2.3)
- Utilizing only the established control entry and exit point from the contaminated area to minimize the potential for cross-contamination and expedite contamination control surveys
- Wearing disposable outer garments and utilizing disposable equipment (where possible).

10.2 Personnel and Equipment Decontamination

Decontamination procedures for personnel and equipment are presented in this section as a contingency only and are not anticipated to be used. If encountered, both chemical and radionuclide contamination will be decontaminated from surfaces at the exit from a contaminated area (if required to be established) and other work zone transition boundaries (CRZ for nonradiological nonhazardous materials, as appropriate).

If radionuclide decontamination operations are required for equipment or areas, they will be performed in accordance with Chapter 4 of the INEEL *Radiation Protection Manual* (Radiological Control Department 2002) and at the direction of RadCon personnel. Nonradionuclide decontamination will be evaluated on a case-by-case basis by the HSO and project IH to determine the most appropriate PPE (Level C protective clothing will initially be selected if airborne contaminants may be generated above the action limits until site monitoring can demonstrate downgrading is warranted). Specific personnel and equipment decontamination methods are provided in the following sections.

10.2.1 Personnel Decontamination

SSSTF construction tasks will be conducted in Level D unless upgrading is warranted. If contamination is encountered, engineering controls in conjunction with project contamination prevention and control practices and proper protective clothing donning and doffing procedures will serve as the primary means to eliminate the need for personnel decontamination.

If contamination is encountered and modified Level D protective clothing is required, the greatest potential for personnel contamination exists from improper doffing of contaminated protective equipment when exiting a radiologically controlled area. If modified Level D is required, procedures for donning and doffing protective clothing will be posted at the entrance and exit to all radiologically controlled areas (if established). Prior to donning PPE, all items will be inspected following the list in Section 9, Table 9-4. Following the donning of protective clothing the HSO and/or RCT will check to verify proper donning technique.

The modified Level D and C PPE provide for the layered barriers required to prevent permeation and minimize external surface contamination. The options for the outermost protective clothing layer (Tyvek QC®, Saranex-23C™, etc.) will depend on the likelihood for deposition of contaminants and the specific tasks, as listed in Table 9-2.

10.2.2 Decontamination in Medical Emergencies

If a person is injured or becomes ill, they should be immediately evaluated by first-aid-trained personnel (within their level of training) at the project task site. If the injury or illness is serious, then the FCC will contact the INTEC SS or the Warning Communications Center (WCC) (if the SS cannot be reached) to summon emergency services. The PM and others also will be contacted, per Section 11.

Medical care for serious injury or illness will not be delayed for decontamination. In such cases, gross decontamination may be conducted by removing the injured person's outer protective clothing (if possible) and other contaminated areas contained with a bag, glove, etc. If contaminated PPE cannot be removed without causing further injury (except for the respirator, which must be removed), potentially contaminated areas of the individual will be wrapped in plastic, blankets, or available material to help prevent contaminating the inside of the ambulance, medical equipment, and medical personnel. The IH and/or RCT (depending on the type of contamination) shall accompany the employee to the medical facility to provide information and decontamination assistance to medical personnel. Contaminated PPE will then be removed at the Central Facilities Area (CFA) medical facility (CFA-1612) and carefully handled to prevent the spread of contamination. The INEEL *Radiation Protection Manual,* Chapter 5, (Radiological Control Department 2002) and MCP-148, "Personnel Decontamination," contain information on proper handling of radionuclide-contaminated wounds.

10.2.3 Equipment Decontamination

No equipment decontamination is anticipated. In the event that contamination is encountered, then isolation controls will be established, where feasible, to prevent contamination of equipment from known or suspected sources. If soil sampling is conducted, equipment will be cleaned using sampling equipment decontamination procedures identified in the applicable field sampling plan. Project IH and RadCon personnel will conduct surveys and collect swipes as deemed appropriate to identify contamination, evaluate isolation methods, material handling techniques, and storage requirements. If extensive decontamination of equipment is required, then the RWP may need to be revised or a new RWP written to identify the PPE dress category and other RadCon requirements.

Where radiological and IH concerns do not prohibit use, SOP-11.5, "Field Decontamination of Sampling Equipment," will be followed. The RadCon and IH personnel will evaluate any contaminated equipment to determine the most appropriate decontamination method based on the nature of the contaminated item, level of contamination, required effort to decontaminate the item, and requirement for decontaminating versus disposing of such items. In some cases, the level of effort and potential for spreading contamination from conducting decontamination tasks far outweigh the benefit from engaging in extensive decontamination efforts to return an item to service. Low-cost consumable items will be discarded if initial decontamination efforts fail or extensive decontamination is required that is not in accordance with ALARA principles.

If nonradionuclide decontamination is required to release equipment, a decontamination pad may be established in the CRC. If it is deemed necessary and appropriate by the project IH, then a wet wiping with an amended water solution (amended with a nonphosphate detergent, e.g., Alconox™) or potentially steam-cleaning of this equipment prior to leaving the CRC may be conducted. An attempt will be made to wipe contaminated surfaces first to minimize generation of waste materials and prevent free liquids from having to be containerized. It is not anticipated that steam cleaning will be required; however, a drainage system that allows for a single collection point will be established if performed. Decontamination wastewater will be collected using a submergible pump and containerized/characterized in accordance with *Manual 8 - Environmental Protection and Compliance* (Environmental Affairs Department 2002) and PRD-4001, "Waste Management."

10.3 Doffing PPE and Decontamination

As stated earlier, Level D PPE is the only expected protective clothing to be worn. However, if contamination is encountered, personnel decontamination will likely be limited to doffing of PPE. If contamination is detected on outer PPE layers, **careful removal of these outer PPE layers will generally eliminate over 99% of surface contamination** and this will serve as the primary decontamination method if protective clothing is contaminated. Removal of contaminated protective clothing using standard radiological doffing techniques (rolling outer surfaces inward while being removed) provides the most effective method for containing and isolating the contaminants and greatly reduces the potential for exposure to other personnel who would be put at risk of cross-contamination from other decontamination methods (washing, brushing, etc.).

Some preliminary surface decontamination of protective clothing may be required if it is grossly contaminated with soil and the potential for the generation of airborne radioactivity exists. This will involve assistance from other personnel inside the contamination area and at the doffing location as described below. The ultimate goal of all decontamination methods is to effectively and efficiently isolate the source of contamination through removal and containment of protective clothing in a sealed bag or waste container.

If required, the specific doffing sequence of modified Level D or C PPE and any required decontamination will be based on the nature of the contamination and specific entry/exit configuration. A general approach for doffing modified Level D or C PPE is described below. However, there is no one doffing strategy that works for all circumstances. Modifications to this approach are appropriate if site conditions change or at the discretion of the project HSO in consultation with the project IH and RadCon personnel. Both radiological and nonradiological (chemical) hazards will be evaluated, as applicable.

10.3.1 Modified Level D PPE Doffing and Decontamination (if required)

If required to be worn, modified Level D protective clothing (Tyvek coveralls, booties, etc.) will be doffed following standard radiological removal techniques (as posted) and will constitute the initial decontamination step. If the protective clothing is also being worn as an anti-C layer, then tape, gloves, booties, and any required dosimetry will be removed following the posted doffing sequence. All PPE will be placed in the appropriately labeled waste container(s) disposal. Doffing and any required decontamination will take place at the EZ/CRC boundary or in a contamination radiological buffer area (RBA)/step-off pad boundary (if a radiological contamination area is established). If exiting a radiologically controlled area, doffing will be followed by conducting a personal contamination survey as stated in the RWP.

10.3.2 Level C PPE Doffing and Decontamination (if required)

If respiratory protection is worn in conjunction with protective clothing (Level C PPE), then the modified Level D sequence will be followed with one additional step. Following protective clothing doffing, respirators will be removed and placed in a separate container. Doffing and any required decontamination will take place at the EZ/CRC boundary or in a contamination RBA/step-off pad boundary (if a radiological contamination area is established). If exiting a radiologically controlled area, doffing will be followed by conducting a personal contamination survey as stated in the RWP.

10.4 Personnel Radiological Contamination Monitoring

If contamination is encountered, appropriate signage and barricades shall be established and an RWP may be required for future entry (*INEEL Radiation Protection Manual*). If required, personnel contamination surveys will be conducted utilizing available instruments as stated in the RWP and as directed by RadCon personnel. RadCon personnel will determine the specific model and type of monitoring instruments (Table 8-4) based on the type and level of contamination. Below are guidelines for conducting a personal contamination survey using hand-held instruments. Survey instructions will be posted inside the contamination RBA (if established). Consult with RadCon personnel regarding any questions related to survey instruments, techniques, or instrument alarms.

Verify that the instrument is in service, the instrument is set to the proper scale, and the audio output can be heard during frisking. Personal contamination surveys will include the following steps:

- Hold probe less than 0.5 in. (1.27 cm) from the surface being surveyed for **beta and gamma** contamination, and approximately 0.25 in. (0.63 cm) for **alpha** contamination (without touching surface).

- Move probe slowly over surface, approximately 2 in. (5 cm) per second for a beta-gamma probe and 1 in. (2.5 cm) per second for an alpha probe.

- If the count increases during frisking, pause 5 to 10 s over the area to provide adequate time for instrument response.

- If the count rate increases to a value greater than 100 cpm above background with a beta-gamma instrument or any detectable contamination with an alpha detection instrument, remain at the step-off pad or immediate area and notify (or have someone notify) RadCon personnel.

- If it is required, the whole body survey should take approximately 2 to 3 min to complete. Remember to frisk hands before picking up the probe. The whole body survey should be performed in the following order:

  - Head (pause at mouth and nose for approximately 5 s) ensuring the entire respirator facepiece sealing surface area of face is surveyed
  - Neck and shoulders
  - Arms (pause at each elbow)
  - Chest and abdomen
  - Back, hips, and seat of pants
  - Legs (pause at each knee)
  - Shoe tops
  - Shoe bottoms (pause at sole and heel)
  - Personnel and supplemental dosimeters
  - Return probe to holder, facing up.

The purpose of this hand-held instrument survey is to detect surface contamination. An automated whole-body survey using a PCM station (or equivalent) must still be conducted prior to utilizing designated eating or smoking areas.

10.5 Disposal of Contaminated PPE and Equipment

10.5.1 Storage and Disposal of Contaminated Materials

No waste beyond industrial and construction waste is anticipated to be generated from the SSSTF construction activities. The contract special condition details waste disposal requirements for industrial waste and construction debris/scrap. Additionally, the requirements in PRD-4001, Waste Management," apply.

If contamination is encountered and investigation-derived waste (IDW) or equivalent waste is generated from construction activities, then equipment that cannot be decontaminated will be bagged, labeled, and containerized in accordance with 10 CFR 835.601(a) (radiological) and (hazardous) waste requirements, and placed in the Staging and Storage Annex (SSA). All IDW generated from sampling and in the decontamination process (if required) will be containerized and sent to the SSA.

10.5.2 Site Sanitation and Waste Minimization

Site personnel will use toilet facilities located at CPP-629. Potable water and soap is available within CPP-629 for personnel to wash their hands and face upon exiting the work area. It is important to note that any required radionuclide contamination surveys must be performed before washing face and hands to prevent accidental spread of contamination.

Waste materials will not be allowed to accumulate at the construction site. Appropriate containers for contaminated (if required) and noncontaminated waste will be maintained at the construction site. All waste generated within established contamination areas/RBA (or as deemed appropriate by INTEC RadCon personnel) must be surveyed before removal from the task site. Personnel should make every attempt to minimize waste through judicious use of consumable materials. All site personnel are expected to make good housekeeping a priority at the construction site.

11. EMERGENCY RESPONSE PLAN FOR THE SSSTF CONSTRUCTION PROJECT

This section defines the responsibilities of the project and the INEEL ERO by providing guidance for responding to abnormal events during construction activities.

This emergency response plan addresses OSHA "emergency response" as defined by 29 CFR 1926.65, "Hazardous Waste Operations and Emergency Response," and DOE "emergencies" as defined by DOE Order 151.1A, "Comprehensive Emergency Management System," and DOE Order 232.1A, "Occurrence Reporting and Processing of Operations Information." This response plan is implemented in concert with PLN-114, "INEEL Emergency Plan/RCRA Contingency Plan."

The "INEEL Emergency Plan/ RCRA Contingency Plan" (PLN-114) may be activated in response to events occurring at the INTEC or at the Site, or at the discretion of the emergency action manager (EAM). Once the INEEL plan is activated, construction project personnel will follow the direction and guidance communicated by the EAM.

Note: The OSHA term "emergency" is not defined the same as an "emergency," as classified by DOE Order 151.1A, "Comprehensive Emergency Management System," and Order 232.1A, "Occurrence Reporting and Processing of Operations Information." For this reason, the term "event" will be used in this section when referring to project OSHA emergencies.

Emergency response plans must be developed and put into place before any project activity begins. Preplanning makes it possible for the project to anticipate, and appropriately respond to, abnormal events that can affect the project. Preplanning also ensures that the project emergency response program is integrated with the INEEL and INTEC emergency response programs. Emergency response program elements that must be completed before starting the project include:

- Implementing emergency warning signals and evacuation routes
- Implementing personnel accountability procedures
- Identifying emergency medical services and the personnel charged with performing those services
- Establishing effective site communications
- Establishing requirements for emergency equipment and supplies
- Establishing the preferred means for notifying the INEEL Emergency Response Organization (ERO) of abnormal events.

Although the SSSTF construction area is outside the INTEC fence, all emergencies will be reported through the INTEC SS to the ERO for classification in accordance with Section 4 of the "INEEL Emergency Plan/RCRA Contingency Plan" (PLN-114). If the INTEC ERO is activated, site emergency response will follow the "INEEL Emergency Plan/RCRA Contingency Plan," INTEC Addendum 2.

On-scene response to and mitigation of site emergencies could require the expertise of both INTEC incident response team (IRT) personnel and INEEL fire department personnel. Emergencies that could occur include

- Accidents resulting in injury

- Fires
- Spills of hazardous/radiological materials
- Tornadoes, earthquakes, and other adverse natural phenomena
- Vehicle or transportation emergencies
- Safeguard and security emergencies
- Emergencies at nearby facilities that could prompt evacuation or take-cover actions at the task site.

11.1 Types of Emergency Events

Note: This HASP addresses three types of emergency events as described in the following sections.

11.1.1 Events Requiring Emergency Notifications

Certain events may not require a response from the INEEL ERO but do require courtesy notification of the INTEC SS. In these cases, the project FCC or designee will immediately notify the INTEC SS or WCC (if the INTEC SS cannot be contacted). The FCC's notification should describe the event (see Section 11.5) and state that no emergency response support is required. Examples of these types of events may include but are not limited to the following:

- Minor personal injury at the site requiring medical evaluation or treatment but not requiring an ambulance response
- Equipment or vehicle accident that results in damage to the vehicle and/or property ONLY
- Any other event deemed potentially reportable.

11.1.2 Events Requiring Local Project Evacuation and/or INEEL ERO Response

Some events that could occur at the construction site or at the INTEC may require support from the INEEL ERO or may require a local area evacuation of the project. In these cases, the project FCC will immediately notify the INTEC SS. If the INTEC SS cannot be contacted immediately, then the WCC will be contacted. The FCC's notification will describe the event (see Section 11.5) and will request emergency response resources as appropriate. After being informed of the event, the INTEC SS may elect to activate the emergency control center (ECC) located in CPP-652. Once the ECC is operational, all emergency response activities will be coordinated through the INTEC EAM. The specific actions to be taken in response to emergency alarms are described in Section 11.5. Examples of these types of events include, but are not limited to, those listed below:

- Fire that is burning beyond an incipient stage and cannot be extinguished with hand-held extinguishers
- Spill at the project that cannot be immediately contained or controlled

- Serious injury to a worker or workers
- Equipment failure or event that could potentially affect other INTEC operations or facilities.

The HSO and FCC will do a positive sweep of the site for personnel accountability purposes, prior to evacuating the site.

Note: When the project site has been evacuated, the FCC will serve as the project area warden and ensure that notification is made to the INTEC SS and/or EAM (if the ECC is formed), declaring that project personnel have been evacuated and accounted for.

11.1.3 Events Requiring Total Facility and Project Evacuation

In the event of an INTEC facility evacuation, the FCC shall notify all project personnel to evacuate orally, by radio, or by using the local evacuation signal. INTEC notification may be via INTEC alarms or other communication (e.g., radio) as initiated by the EAM for protective actions. The HSO and FCC will do a positive sweep of the project site for personnel accountability purposes, prior to evacuating the site.

Note: When an evacuation is called for by the EAM, the FCC will serve as the project area warden and ensure that notification is made to the INTEC SS and/or EAM (if ECC is formed), declaring that project personnel have been evacuated and accounted for.

11.2 Emergency Facilities and Equipment

Emergency response equipment, including the items described in Table 11-1, will be maintained at the construction site. INTEC Addendum 2 to the INEEL Emergency Plan lists emergency equipment available at INTEC. This includes the ECC located in Building CPP-652, equipment located in INTEC, and the IRT vehicle. Additional heavy construction and other equipment listed in PLN-114, Addendum 2, is available for use during emergencies. The INEEL fire department maintains an emergency HAZMAT response van that can be used to respond to an event or emergency at the project. Fire department personnel are also trained to provide immediate hazardous material spills and medical services. At least two persons with current medic/first aid training will be present at the SSSTF construction site when conducting construction tasks.

11.3 Emergency Communications

Note: If the INTEC SS cannot be contacted, then the WCC will be notified of the event and the information listed below communicated. The WCC must also be told that INTEC notification of the INTEC SS/EAM has not been made.

In the event of an emergency, the capability to summon INEEL emergency response resources, to immediately notify site personnel, and to inform others of site emergencies, is required. Communications equipment at the task site will be a combination of radios, telephones (mobile, cellular, or facility), and pagers. The following communication methods will be used during emergency situations:

Table 11-1. Emergency response equipment to be maintained at the project site.

Equipment Name and Quantity Required	Location at Task Site	Responsible Person	Frequency of Inspection
Fire extinguishers[a]	Located throughout the construction area, refueling area, laydown area, and on each piece of heavy equipment	Construction superintendent	Monthly
First aid supplies	Vehicles and construction trailer	Construction superintendent	Inspect seal monthly or immediately if seal is broken
Eyewash bottle[b] Eyewash station	At construction site	Construction superintendent	Monthly or replace after use
Hazardous materials spill kit	At construction site	Construction superintendent	Monthly
Radiological spill kit	CPP-659 RadCon office	INTEC RadCon	After each use
Communication equipment available	On site	FCC/HSO	Availability and daily functional check

a. A minimum of one 10A/60BC extinguisher.

b. An eyewash bottle will be used to provide an immediate eye flush if required. An eye wash station is available within the INTEC operations area that meets the ANSI Z 358.1-1998 requirements. This location will be identified by the IH during the pre-job briefing. (An eyewash station can also be staged at the construction site.)

The INTEC SS will be notified of any project emergency event. The SS will then make the required INTEC and INEEL ERO notifications.

The following information should be communicated (as available) to the SS:

- The caller's name, title (e.g., FCC, HSO), telephone number, pager number
- Exact location of the emergency
- Nature of the emergency including time of occurrence, current site conditions, and special hazards in the area
- Injuries, if any, including numbers of injured, types of injuries, conditions of injured
- Emergency response resources required (e.g., fire, HAZMAT, ambulance)
- Additional information as requested.

Other project contact numbers are provided in Section 11.8.

11.4 Emergency Response Roles and Responsibilities

11.4.1 Project Personnel Involved in Emergencies

11.4.1.1 Field Construction Coordinator. The FCC, or designated alternate, is responsible for initiating all requests for emergency services (fire, medical, etc.) and for notifying the INTEC SS of abnormal or potential abnormal events occurring on the project. In addition, the FCC or designated alternate (HSO) will serve as the construction project area warden. The FCC is responsible for conducting personnel accountability at the project site. This will be accomplished by completing positive sweeps of all construction areas to ensure all personnel are aware of the emergency event. All personnel will be directed to the designated assembly point where the attendance log will be used to determine what personnel are onsite (role call). The FCC will then report accountability status to the INTEC SS/EAM.

Additionally, the FCC will control the scene until a member of the incident command system (ICS) authority arrives at the scene to take control as the on-scene commander (OSC). When communicating emergency information to the OSC, the FCC, or designated alternate, will provide all requested information regarding the nature of the event, potential hazards, and other information requested.

11.4.1.2 Construction Project Personnel. Every person at the project has a role to play during an event or INEEL emergency. Each employee must be constantly aware of potential problems or unexpected hazardous situations and immediately report these situations to the FCC or HSO. All employees are expected to watch out for their fellow workers, to report their concerns to the FCC, and to respond to emergency events, as provided for in this HASP. Specific project personnel responsibilities are outlined in Table 11-2.

Table 11-2. Responsibilities during an emergency.

Responsible Person	Action Assigned
Any construction worker	Signal evacuation or take-cover
Any fire-extinguisher-trained project worker	Extinguish fires (incipient fires only) or contain spills (within level of training)
Any medic first aid/ CPR-trained personnel	Provide first aid within level of training (on a voluntary basis)
FCC	Contact the INTEC SS or EAM (if ECC has formed)
FCC	Contact the INEEL site emergency telephone number or the WCC (if INTEC SS can not be contacted)
FCC	Conduct personnel accountability and report information to the INTEC SS or ECC
FCC	Report incipient fires to the INEEL fire department
	Report spills to the INEEL spill notification team
HSO	Report occupational injuries/illnesses to the OMP

11.5 Emergencies, Recognition of Warnings, and Response

11.5.1 Emergency Recognition and Response

All construction site personnel should be constantly alert for signs of potentially hazardous situations, including signs and symptoms of chemical or radiological exposures or releases. Site personnel will be trained on the methods, signals, and alarms used to convey "EVACUATION" and "TAKE COVER" and on immediate response actions. Site personnel should ensure that an RCT surveys the area (as applicable) to determine the extent of a radiological material spill and/or IH surveys the area to determine the extent of a chemical spill.

The primary INEEL fire station is located at CFA-1611. Fire department personnel have response capabilities for first aid, medical emergencies, transport, fires, and hazardous material spills. Figure 11-1 shows the route to the CFA medical dispensary. Figure 11-2 shows the SSSTF evacuation routes and assembly areas.

A local (project personnel only) tabletop emergency drill will be conducted at the start of the construction activity. The purpose of the drill is to familiarize personnel with their respective emergency response actions. Additional drills may be conducted at the discretion of the FCC. Each drill or actual emergency at the task site will be followed by a critique, and any deficiencies that are identified in the response plan, procedures, or actions will be corrected.

11.5.2 Alarms

Alarms and signals are used at the project site and the INEEL to notify personnel of abnormal conditions requiring a specific response. These include radiation-monitoring alarms denoted by fast-ringing bells and fire alarms, which vary from building to building within the INTEC area. Responses to these alarms are addressed in the general employee training. In addition to the alarms previously described, emergency sirens located throughout the INTEC serve as the primary means for signaling emergency TAKE COVER or EVACUATION protective actions. To signal site personnel of a project-initiated emergency event, a separate set of emergency signals has been established based on hand-held air horns. These signals are described in Table 11-3.

11.5.2.1 Take Cover. Radiation or hazardous material releases, weather conditions, or other events or emergency conditions may require that all personnel take cover indoors in the nearest building. A TAKE COVER protective action may be initiated as part of a broader response to an emergency situation and may precede an evacuation order. The order to TAKE COVER is usually announced by activating the INTEC emergency siren. The signal to take cover is a CONTINUOUS SIREN that can be heard throughout the INTEC area. Remember, **STEADY = STAY**. But the order to take cover can also be given by word of mouth, radio, or voice paging system. When ordered to TAKE COVER, project personnel shall place the site in a safe condition (as appropriate) and then seek shelter in project vehicles or the nearest available INTEC/construction building. Eating, drinking, and smoking are not permitted during TAKE COVER conditions.

Project RadCon personnel will assist and direct all workers exiting from radiological contamination areas during a TAKE COVER alarm.

11.5.2.2 Total Area Evacuation. A total area evacuation is the complete withdrawal of personnel from the project site and the entire INTEC area. The evacuation signal is an ALTERNATING SIREN that can be heard throughout INTEC. Remember, **ALTERNATE = EVACUATE**. A single long blast of the air horn or vehicle horn serves as the project's alternate emergency evacuation alarm.

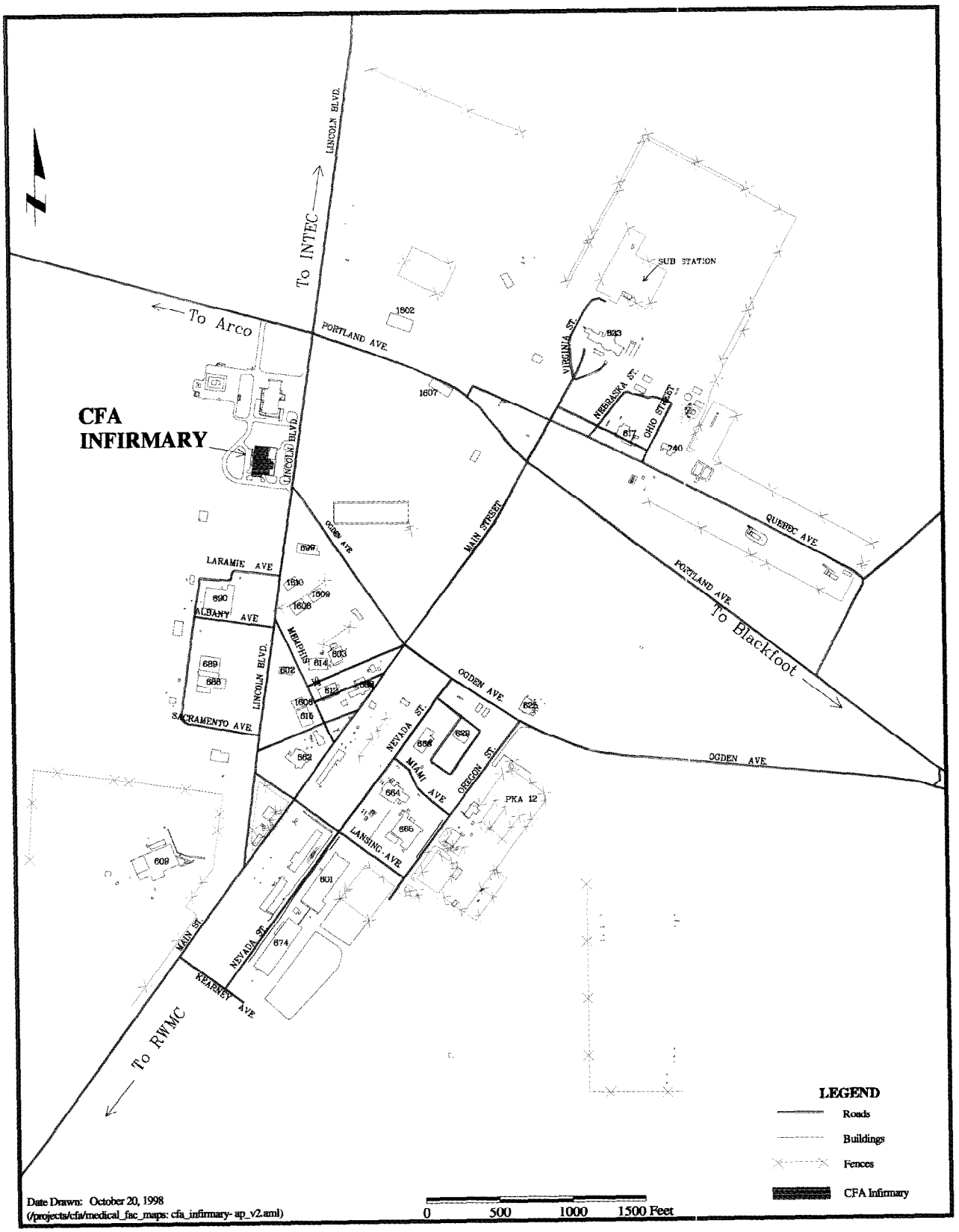

Figure 11-1. Map showing the location of INEEL dispensary (CFA-1612).

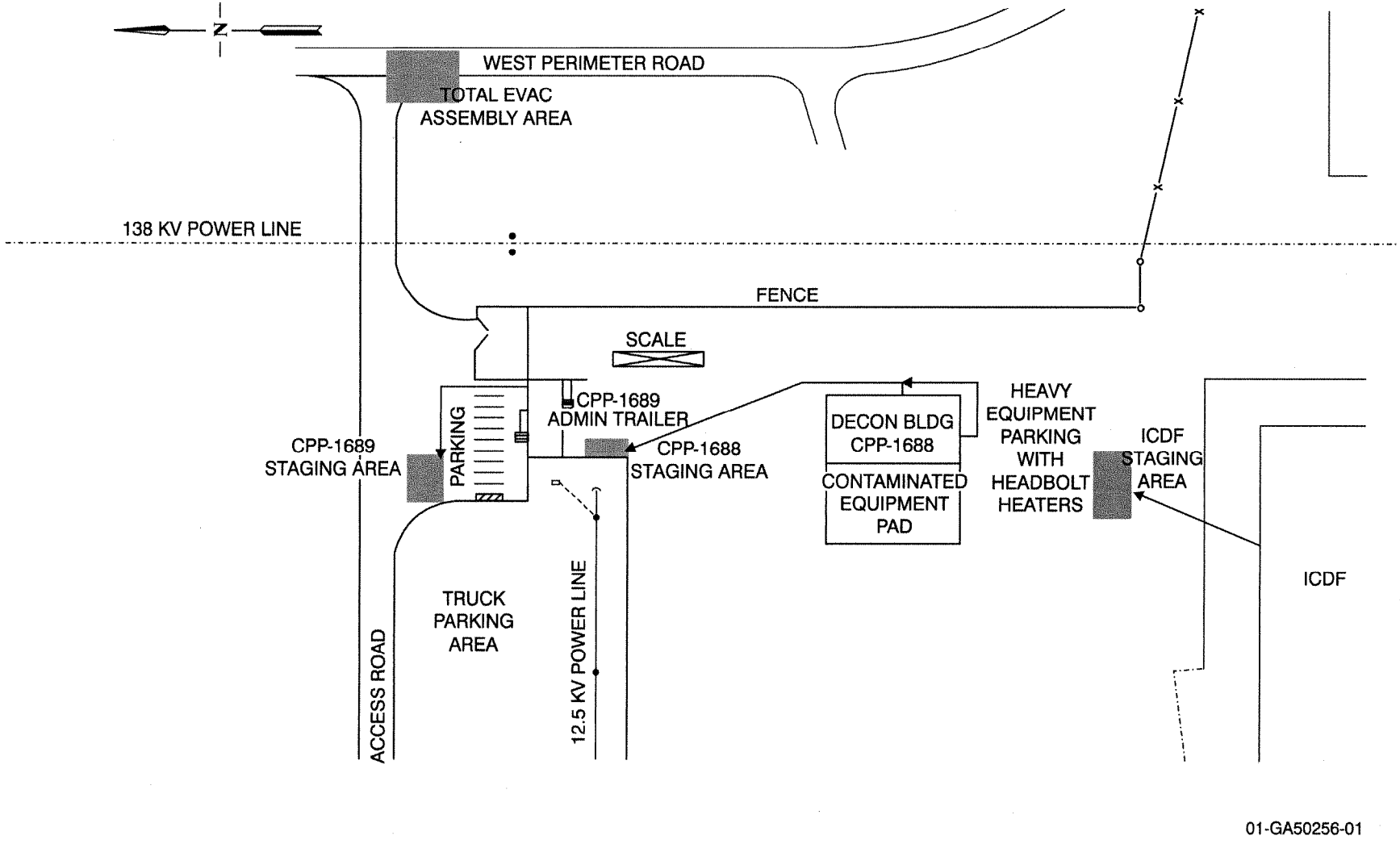

Figure 11-2. SSSTF evacuation routes and assembly areas.

However, the order to evacuate can also be given by word of mouth, radio, or voice paging system. When ordered to EVACUATE, project personnel shall place the site in a safe condition (as appropriate) and then proceed along the specified evacuation route to the designated assembly area, or as directed by the EAM. Project RadCon, IH, and HSO personnel will assist and direct all workers exiting from radionuclide-contamination areas during an EVACUATION alarm. Eating, drinking, and smoking are not permitted during emergency evacuations.

For total area evacuations, the INTEC ECC is activated and all personnel gather at the primary INTEC evacuation assembly area or the location designated by the EAM. The FCC or trained alternate will then complete the personnel accountability using the attendance log. In this situation, the project area warden reports the result of the accountability process to the INTEC EAM.

11.5.2.2 Local Area Evacuation. A local area evacuation is the complete withdrawal of personnel from the construction site, but it does not require the complete evacuation of the entire INTEC area. The air or vehicle horn will serve as the project's primary emergency evacuation signal (as listed on Table 11-3). However, the order to evacuate can also be given by word of mouth, radio, or voice paging system. When ordered to evacuate the project site, personnel shall place the site in a safe condition (as appropriate) and then proceed along the specified evacuation route to the assembly area designated for local area evacuations, or as directed by the FCC. Eating, drinking, and smoking are not permitted during emergency evacuations.

Project RadCon personnel will assist and direct all workers exiting from radiological contamination areas during a evacuation alarm.

11.5.3 Personnel Accountability/Area Warden

Project personnel are required to evacuate the site in response to TAKE COVER, EVACUATION, and local evacuation alarms. In each case, the FCC shall account for the people present on the site at the time the alarm was initiated. The FCC or trained alternate serves as the area warden for the project and completes the personnel accountability (following positive sweeps of the project site). The results of this accountability will then be communicated to the FCC for reporting to the INTEC SS or EAM (if the ECC has been formed).

Table 11-3. Project internal and backup emergency air-horn signals.

Device or Communication Method		Signal and Associated Response
Air horn or vehicle horn	**One Long** Blast	Emergency evacuation. Leave immediate area and proceed to upwind location or location designated by FCC, RCT, or IH. Proceed to project assembly area or alternate location based on site-specific conditions.
	Two Short Blasts	Nonemergency evacuation. Leave work area, perform normal doffing of PPE and contamination surveys (if required), then proceed directly to project assembly area.
	Three Long Blasts	All clear, return to site.

11.5.4 Notifications

As directed by the office of the Secretary of Energy, the INTEC SAD is responsible for immediately notifying the DOE and local off-Site agencies of all significant abnormal events that occur at the INTEC. This duty is in addition to the notification requirements established in INEEL procedures for events that are categorized as emergencies or unusual occurrences. For this reason, the project shall immediately report all abnormal events that occur on the project site to the INTEC SS. The INTEC SS will then notify WCC who will in turn notify the appropriate INEEL emergency response resources and other INEEL facilities as appropriate. Normally the FCC is responsible for making the INTEC SS event notifications described above. The FCC may make additional notifications as listed in Section 11.9, Table 11-4, "Project notification responsibilities."

11.5.5 Evacuation Routes

The SSSTF maintains primary and secondary evacuation routes (Figure 11-2). These routes may be used in response to a total INTEC area evacuation as directed by the EAM. Copies of the evacuation routes shall be available at the site.

In the event that the SSSTF construction area (but not the entire INTEC area) is evacuated, personnel shall assemble in the designated assembly area or as directed by the FCC. If a total area evacuation of the INTEC is ordered, then project personnel shall relocate to the SSSTF primary evacuation assembly area or as directed by the EAM.

Table 11-4. Project notification responsibilities.

Activity	Title/Organization	Phone	Pager	Radio
Field Construction Coordinator (FCC)				
Notifies	INTEC SS or EAM (if the command post has been formed)	6-3100	2096	D-Net
Contingency	If the INTEC SS or EAM cannot be contacted, the FCC will make direct communication with the WCC and request all required resources (e.g., fire department, ambulance)	777 or 6-1515	NA	KID 240
Notifies	For spills: Environmental Affairs Spill Team	NA	6400	NA
Notifies	Construction manager	6-6601	5659	CM-Sub "Unit 1"
Notifies	SSSTF project engineer	6-3115	9232	NA
Notifies	DOE-ID SSSTF project manager	6-4978	NA	NA
SSSTF Construction Project - Project Engineer (PE)				
Notifies	ER director	6-7022	6987	NA
Notifies	ER S&H manager	6-9566	7460	NA

NA = not applicable

11.6 Reentry and Recovery

11.6.1 Reentry

During an emergency response it is sometimes necessary to reenter the scene of the event. Reasons for performing a reentry may include the following:

- Personnel search and rescues
- Medical first aid responses
- Safe shutdown actions
- Mitigating actions
- Evaluate and prepare damage reports
- Radiation and/or hazardous material surveys.

Reentries shall be carefully planned to ensure that personnel are protected from harm and to prevent initiating another emergency event. Reentry planning is undertaken as a graded approach depending on the nature of the initiating event.

11.6.1.1 Recovery

After the initial corrective actions have been taken and effective control established, response efforts will shift toward recovery. Recovery is the process of assessing post-event/emergency conditions and developing a plan for returning to pre-event/emergency conditions, when possible, and following the plan to completion. The EAM is responsible for determining when an emergency situation is sufficiently stable to terminate the emergency and enter the recovery phase. The PM will appoint the recovery manager.

11.7 Critique of Response and Follow-up

A review and critique will be conducted following all emergency events, drills, and exercises at the INEEL. In some cases an investigation may be required prior to commencing recovery actions. For this reason, care should be exercised to preserve evidence when appropriate.

11.8 Telephone/Radio Contact Reference List

Table 11-5 lists the points of contact for the project. This list will be available in the construction trailer at all times.

Table 11-5. Project emergency contact list.

Contact Title	Contact Name	Phone Number/ Radio Net	Pager Number
Warning Communications Center (WCC), fire, security	Individual on shift	6-1515	NA
INTEC shift supervisor (SS)	Individual on shift	6-3100	2096
INTEC facility manager	James Barker	6-3432	7667
INTEC site area director (SAD)	Art Clark	6-3334	7957
		521-7361	NA
First Aid (CFA Medical Dispensary, CFA-1612)	NA	6-2356	NA
Occupational Medical Program (OMP)	NA	6-1596	NA
SSSTF project engineer	Jestin Hurst	6-3115	9232
SSSTF project manager	Lee Davison	6-3770	5744
ER director	Doug Jorgensen	6-7022	6987
Field construction coordinator (FCC)	Lex Strain	6-6858	6475
Construction manager (CM)	Max Hammond	6-5763	3377
INTEC radiological control engineer	Arlo Summers	6-8259	5963
Industrial hygiene (IH)	Jonathon Roberts	6-5386	3351
Industrial safety	L. McManamon	6-3658	4903
Health & safety officer (HSO)	L. McManamon	6-3658	4903
INTEC ESH&QA manager	Corrine Jones	6-8079	5728
DOE-ID WAG 3 Manager	T. W. Jenkins	6-4978	NA
DOE-ID ER Manager	K. E. Hain	6-4392	NA

NA = not applicable

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